CCD-V800E
RMT-503

SERVICE MANUAL

AEP Model
UK Model

Remote commander RMT-503 is available as a unit, but as indivdual parts the battery case lid of commander is only available.

video Hi8 Handycam

U MECHANISM

- **As for the adjustments is issued separately.**

SPECIFICATIONS

System

Video recording system	Rotary two heads Helical scanning FM system
Audio recording system	Rotary head, FM system (2 channels)
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassettes
Tape speeds	SP mode: Approx. 20.051 mm/sec. LP mode: Approx. 10.058 mm/sec.
Recording time	SP mode: 1.5 hours (E5/P5 – 90) LP mode: 3 hours (E5/P5 – 90)
Playback time	SP mode: 1.5 hours (E5/P5 – 90) LP mode: 3 hours (E5/P5 – 90)
Fast forward/rewind time	Approx. 7 min. (E5/P5 – 90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (Black and white)
Lens	Combined 10 × power zoom lens f = 8 to 80 mm, F1.8 with macro Filter diameter 46 mm
Auto focus system	TTL
Colour temperature	Auto, one push white balance, ☼ 3,200 K ☀ 5,800 K
Minimum illumination	4 lux (F1.8)
Illumination range	4 lux to 100,000 lux (0.4 to 9,294 footcandles)
Recommended illumination	More than 100 lux (9.3 footcandles)
Shutter speed control	1/50 to 1/10000 (28 steps)
Aperture control	Auto/manual (16 steps)
Gain control	Auto/manual (8 steps)

Input and output connectors

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced, sync negative
S video ouput	4-pin mini-DIN Luminance signal: 1 Vp-p, 75 ohms, unbalanced, sync negative Chrominance signal: 0.3 Vp-p 75 ohms, unbalanced
Audio output	Phono jacks (2: stereo L and R), –7.5 dBs at 47 kilohms input impedance Impedance less than 1 kilohm
RFU DC OUT	Special minijack, 5 V DC
Headphones jack	Stereo minijack, 8-ohm impedance
REMOTE jack	Stereo mini-mini jack

— continued on next page —

For MECHANICAL ADJUSTMENTS, refer to the "8mm Video MECHANICAL ADJUSTMENT MANUAL III (U MECHANISM)" (9-972-732-11)

Hi8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

Microphone jack	Stereo minijack, −66 dBs low impedance with 2.5 to 3 V DC, output impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

General

Power requirements	On battery mounting surface 6.0 V (battery pack), 7.5 V (AC power adaptor), 9.0 V (alkaline batteries)
Power consumption	6.9 W (camera recording, including the viewfinder)
Installation	Vertically, horizontally
Operating temperature	0° C to 40° C
Storage temperature	−20° C to 60° C
Dimensions	Approx. 105 × 138 × 356 mm (w/h/d)
Weight	Approx. 1.2 kg excluding the battery and the cassette
Microphone	Electret condensor microphone Uni-directional, stereo type

Design and specifications subject to change without notice.

Note
This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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SECTION 1
GENERAL

This section is extracted from instraction of manual.

Introduction

Overview of the CCD-V800E

The CCD-V800E Video Hi8 handycam is a compact colour video camera/recorder (camcorder). You can use it to shoot the pictures you want and play them back on your television set. It is equipped with a stereo recording system which offers high quality sound to match the Hi8 picture. The full featured camera section offers various camera adjustments to create just the kind of programme you wish.

Who this Manual is for

This manual is designed for you. You can use this manual to find exactly the information you need, whether you are familiar with video equipment or not.

How this Manual is Organized

This manual consists of seven sections.
Section 1 explains the preliminary steps necessary to prepare for shooting and playback.
Section 2 explains the very basic techniques of shooting.
Section 3 explains how to play back the tape being shot in section 2.
Section 4 explains additional shooting techniques which will add flavor to your programmes.
Section 5 explains the unique shooting techniques including the programmed AE mode and the manual mode.
Section 6 explains the techniques on how-to-edit your video programmes.
Section 7 explains other useful information to enjoy the best of your camcorder.

If you have any problem during operation, see the "Trouble Checks" section.

If you are beginner, start with "Recording a picture with the automatic adjustments." If you are very familiar with camcorder operation, also refer to "Operating the Camera Section (2) and (3)" for advanced shooting techniques.

How this Manual Works

Refer to the information below to help you follow the instructions in this manual.

- Controls and settings on the camcorder are shown in capital letters:
  ex. Set the POWER switch to CAMERA.
- The letter in an illustration corresponds to the letter in the text:
  ex. (A-1) or (B)
- The step numbers in an illustration correspond to the step numbers in the text.
- Notes and cautions are enclosed with lines.
  ex.

Note on batteries
Battery will not last as long in cold places.

Supplied Accessories

The camcorder is packed together with the following units. Check to see that everything is contained in the package.

- Wireless Remote Commander RMT-503 (1)
- R6 (size AA) batteries for the Wireless Remote Commander (2)
- Battery pack NP-66H (1)
- AC power adaptor AC-V35/V35A (1)
- Lithium battery CR2025 (1)
- RFU adaptor RFU-90E (1), or RFU-89EA (1) With the RFU-89EA, an aerial selector and a screwdriver are supplied.
- A/V connecting cable (3 phono to 3 phono) (1)
- Video cable with S video connectors (4-pin mini DIN to 4-pin mini DIN) (1)
- Cassette tape (1)
- Shoulder strap (1)
- Jack covers* (1 set)
- Lens cap* (1)

Items with an asterisk (*) is attached to the unit.

Technical Information

Hi8 (High Eight) Video System

The 8 mm video system employs a metal powder tape. This means the video camera recorder is capable of recording a large amount of information and enhances picture quality. Taking advantage of the 8 mm video system, the Hi8 video system has been developed. The main characteristics of the Hi8 video system are as follows:

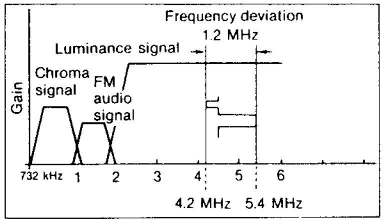
Super High Quality Picture

(A-1), (A-2)

The information capacity is a key element for picture improvement. It can be increased by shifting up the FM carrier frequency range. In the Hi8 video system, the FM carrier frequency range of the luminance signal is shifted up to 5.7–7.7 MHz. This is higher than the 4.2–5.4 MHz range of the standard 8 mm video system. Thanks to this, the horizontal resolution is improved to more than 400 lines.

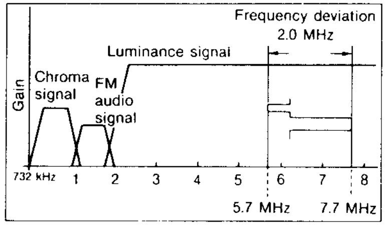
(A-1)

Frequency allocation of the standard 8 mm video system



(A-2)

Frequency allocation of the Hi8 video system



Use of High Grade Tape to Match the Hi8 Video System

Metal evaporated tape is ideal for video systems because it has large magnetic energy that allows for high-density recording. The Hi8 video camera recorder uses such high-grade tape for the Hi8 video system, covering a wide frequency range, to achieve a high-quality video signal for recording/playback.

S VIDEO (Separate Luminance/Chroma Signal) Output Connector

Conventionally, video equipment exchanges the composite video signal containing the luminance (Y) signal and the chroma (C) signal mixed. The composite video signal is liable to produce interference resulting in picture quality loss. On the contrary, an S VIDEO connector transmits or receives the video signal separated into the luminance signal and the chroma signal. Flickers and colour blur in the picture are minimized with the separated video signal, and sharpness is enhanced to such an extent that hair and fine stripes are clearly visible. The S VIDEO connector also assures an excellent editing quality with minimum picture quality loss.

Compatibility with Conventional Video Camera Recorders

A high-quality picture can be recorded and played back on a tape for the Hi8 video system.

Recording with this unit

Hi8 tape **Hi8**

MODE SET menu " **Hi8** " to "AUTO" → Tapes recorded in the Hi8 video system

MODE SET menu " **Hi8** " to "OFF" → Tapes recorded in the standard 8 mm video system

Standard 8 mm tape **8**

Regardless of the " **Hi8** " setting in the MODE SET menu → Tapes recorded in the standard 8 mm video system

Playback with this unit

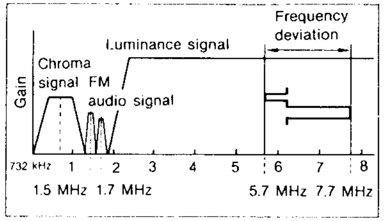
Tape recorded in the Hi8 video system
Tape recorded in the standard 8 mm video system
→ The recording mode is selected automatically.

- A tape recorded in the Hi8 video system cannot be played back with an conventional 8 mm video camera recorder.
- A standard 8 mm tape **8** cannot be recorded in the Hi8 video system.
- A tape for the Hi8 video system **Hi8** cannot be recorded and played back in the Hi8 video system with a conventional video camera recorder.
- The recording tape speeds in the Hi8 video system are compatible with the conventional 8 mm format.
  Recording/playback time in the SP mode is 1.5 hours using a E5-90/P5-90 tape or the equivalent.

Cassette used	**With this unit**		
	Recording		**Playback**
	Hi8	**Normal**	
Standard 8 mm tape **8**	No	Yes	Yes
Hi8 tape **Hi8**	Yes	Yes	Yes

(A-3)

Frequency allocation of the hi-fi system



Hi-Fi Stereo System

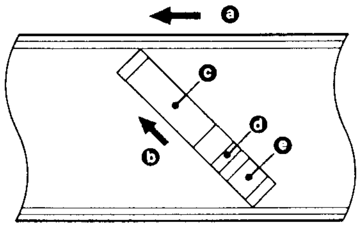
On the 8 mm video standard track the sound is conventionally recorded/played back in AFM hi-fi monaural. On this camcorder, an AFM hi-fi stereo sound can be recorded on the standard track.
The AFM hi-fi stereo sound is recorded as L+R on the 1.5 MHz carrier and L−R on the 1.7 MHz carrier in FM as illustrated. **(A-3)** This method was adopted to maintain compatibility with the conventional AFM hi-fi monaural sound.

When playing back the tape recorded in this hi-fi stereo system, a matrix circuit is used to produce the L and R stereo sounds separately. When a conventional AFM hi-fi monaural model is used to play back a tape recorded by this camcorder in AFM hi-fi stereo, the playback sound will be in an L+R monaural sound. This is because the monaural models will play back only the sound recorded in the 1.5 MHz carrier.
The AFM hi-fi stereo system of this camcorder enables you to enjoy a live stereo sound atmosphere.

Compatibility with the conventional 8 mm video format
When you play back a tape recorded in AFM stereo hi-fi on a conventional 8 mm video equipment, the sound will be in monaural.

(A-4)

8 mm video tape format



RC Time Code and Data Code

The RC time code and data code are automatically marked during camera recording. Later, you can display these codes during playback, and edit the displayed codes onto another tape.

What the RC time code is
The RC time code indicates the absolute position of the tape with hour, minute, second and frame. Since the time code number exactly corresponds to every frame* of picture, it functions as an accurate tape counter.
You can write the RC time code on a prerecorded tape as necessary.

*The TV screen displays 25 frames of pictures per second. The RC time code number advances in accordance with each frame.

What is the data code
The data code indicates the date (year, month and day) and time (hour, minute and second) when a recording is done. The data code can be displayed during playback as necessary. It is useful when you want to know the recording date and time.

8 mm video tape format
An 8 mm video tape track is divided into several areas so that the specified information is to be recorded in each area. This camcoder records the RC time code and data code as well as index signals in one of the areas.

The 8 mm video tape format is shown in **(A-4)**.
ⓐ Tape transport
ⓑ Head transport
ⓒ Video + audio (Hi-fi stereo) (Standard track)
ⓓ Index, RC time code and data code
ⓔ PCM audio (stereo) (not used with this unit)

Note on the RC time code
The "RC" time code stands for Rewritable Consumer time code.
This is a special time code for consumer 8 mm products, and is not compatible with the 8 mm time code for institutional 8 mm products.

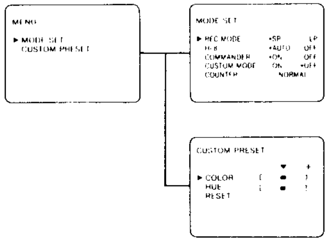
Note on the editing of the RC time code and data code
The RC time code and data code can be duplicated on another tape only when they are displayed on the screen. The signals of these codes cannot be edited.

When editing a tape using the RC time code
Rewrite the RC time code from the beginning to the end of the tape before editing. Refer to "Writing the RC time code on a prerecorded tape" on page 64. When rewriting, the previously recorded data code and index signals are deleted.

On the Menu System

The menu system of this camcorder enables setting and adjustments to further enjoy the features and functions. The menu is displayed in the viewfinder or on the TV screen if connected to a TV. The menu consists of two main parts, one for use during camera recording and the other for use during playback. Refer to the following section for a quick overview of the two menus.

(B-1)


MENU
▶ MODE SET
CUSTOM PRESET
MODE SET
▶ REC MODE •SP LP
Hi8 •AUTO OFF
COMMANDER •ON OFF
CUSTOM MODE ON •OFF
COUNTER NORMAL
CUSTOM PRESET
▼ +
▶ COLOR [▬]
HUE [▬]
RESET

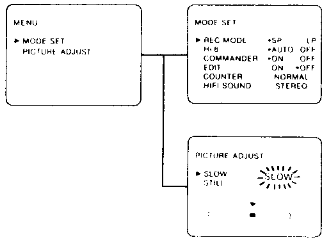
Menu System for Camera Recording

(B-1)

MODE SET
Various mode settings for camera recording is made in this menu.

CUSTOM PRESET
The camcorder can be adjusted to perform camera recording in the desired picture.

(B-2)


MENU
▶ MODE SET
PICTURE ADJUST
MODE SET
▶ REC MODE •SP LP
Hi8 •AUTO OFF
COMMANDER •ON OFF
EDIT ON •OFF
COUNTER NORMAL
HIFI SOUND STEREO
PICTURE ADJUST
▶ SLOW
STILL
SLOW

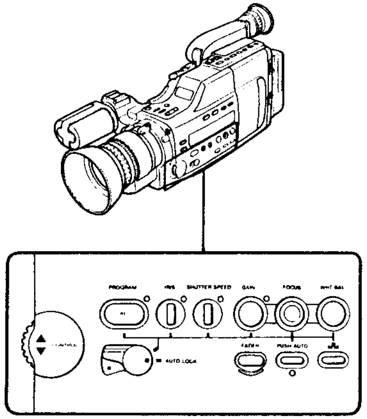
Menu System for Playback

(B-2)

MODE SET
Various mode settings for playback are made in this menu.

PICTURE ADJUST
The playback picture can be adjusted to obtain maximum quality.

(C)


PROGRAM
IRIS
SHUTTER SPEED
GAIN
FOCUS
WHT BAL
CONTROL
AUTO LOCK
FADER
PUSH AUTO

Selecting the Camera Recording Modes

(C)

Various camera recording modes are available in this camcorder. Automatic adjustment of aperture, gain, white balance, focus, plus the locked shutter speed offers worry-free camera recording for the beginner. Manual adjustment of each of these parameters offers effective camera recording to meet different object and shooting conditions.
Plus, the programmed AE mode offers additional shooting techniques to enrich the creation of your video programme.

Full Automatic Adjustment Mode

When the AUTO LOCK switch is set to AUTO LOCK, aperture, gain, white balance, and focus is automatically adjusted and the shutter speed is locked to the normal speed (1/50).

Manual Adjustment Mode

By setting the AUTO LOCK switch down, each parameter can be adjusted manually.

IRIS

- Each press of this button switches between automatic and manual adjustment.
- 15 aperture values (F1.8 to F19) plus aperture close can be selected using the CONTROL dial in the manual mode.

SHUTTER SPEED

- Each press of this button switches the shutter speed as follows:
  1/50 (No indication) → 1/120
  └── 1/1000 ←──┘
- 28 shutter speeds (1/50 to 1/10000) can be selected using the CONTROL dial in the manual mode.

Continued on the next page

GAIN

- Each press of this button switches between automatic and manual adjustment.
- 8 gain levels (−3 dB to +18 dB) can be selected using the CONTROL dial in the manual mode.

FOCUS

- Each press of this button switches between automatic and manual focusing.

PUSH AUTO

- When pressed during manual focusing mode, automatic focusing is activated for the extension that the button is pressed.

WHT BAL (white balance)

- Each press of this button switches the mode as follows:

Automatic (no indication) → ▲ (One-push adjustment)
↑ ↓
✳ (Indoors) ← ☀ (Outdoors)

▲ (One-push white balance)

- When pressed during ▲ mode, the white balance can be adjusted manually.

Programmed AE Modes

By setting the AUTO LOCK switch down, four programmed AE modes can be selected to match distinctive camera recording conditions.

Portrait mode
Use to focus on the subject and to have the background out of focus. The aperture and shutter speed is automatically adjusted to maintain the appropriate exposure according to the size and brightness of the subject.

Sports mode
Use to shoot subjects moving at high speeds and then play it back clearly in slow or still. The aperture and shutter speed are automatically adjusted to maintain the appropriate exposure according to the speed of the subject.

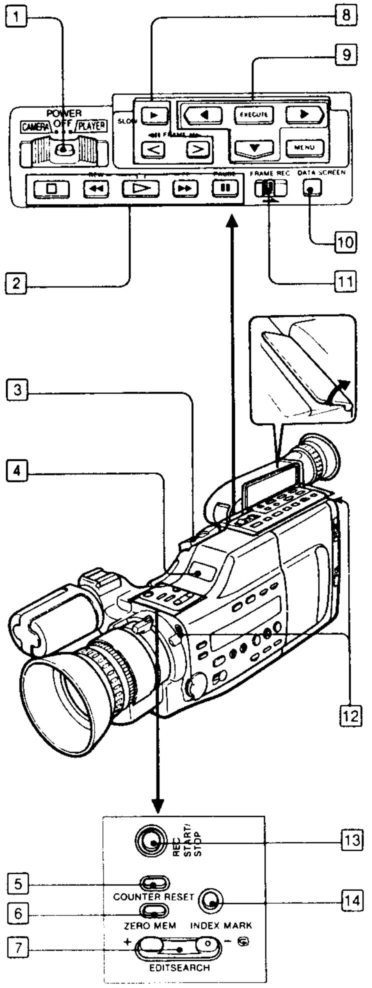
Aperture priority mode
Select the desired aperture (F1.8 to F19) with the CONTROL dial and the shutter speed will be automatically adjusted to maintain the appropriate exposure.

Shutter priority mode
Select the desired shutter speed (1/50 to 1/10000) with the CONTROL dial and the aperture will be automatically adjusted to maintain the appropriate exposure.

Note
Focus and white balance can either be adjusted automatically or manually during the programmed AE mode. The adjusting method is same as those in the "Manual Adjustment Mode."

Identifying the Parts

(D-1)


1
2
3
4
5
6
7
8
9
10
11
12
13
14
POWER
CAMERA
OFF
PLAYER
SLOW
EXECUTE
MENU
FRAME REC
DATA SCREEN
REC START/STOP
COUNTER RESET
ZERO MEM
INDEX MARK
EDITSEARCH

(D-1)

For details of the use of each parts, refer to the pages indicated.

1 POWER switch
CAMERA: for camera recording
PLAYER: for playing back or editing tapes
OFF: power off

2 Tape transport buttons ㊼, ㊽
■ (stop)
◀◀ REW (rewind)
▷ (playback)
▶▶ FF (fast-forward)
❚❚ PAUSE

3 Power zoom button (74)

4 Remote control sensor ⑳

5 COUNTER RESET button ㊲, (52)

6 ZERO MEM (memory) button ㊲, (52)

7 EDITSEARCH (and recording review) buttons ㉟

8 Tape transport buttons ㊽
❚▶ SLOW (slow speed playback)
< ◀❚❚/> ❚❚▶ FRAME (direction switch/frame-by-frame playback)

9 Menu operation buttons ㊸, (61)
MENU
EXECUTE
◀/▶/▼

10 DATA SCREEN button (59)

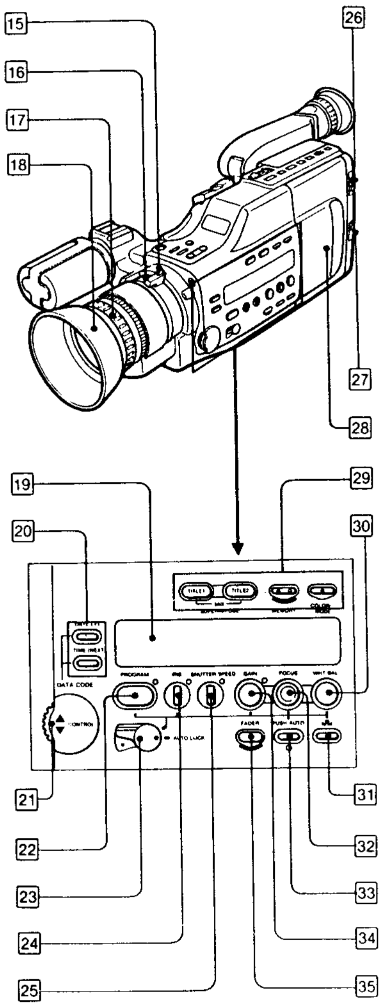
11 FRAME REC (frame recording) button (77)

12 Camera recording/battery lamps (120)
Light during camera recording. Blink when the battery is exhausted, or the tape reaches its end.

13 REC (recording) START/STOP button for low position camera recording ㉜
Use this button instead of the START/STOP button for low-position recording.

14 INDEX MARK button ㊴, (54)

(D-2)


15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
TITLE 1
TITLE 2
MEMORY
COLOR MODE
DATA CODE
PROGRAM
IRIS
SHUTTER SPEED
GAIN
FOCUS
WHT BAL
CONTROL
AUTO LOCK
FADER
PUSH AUTO

(D-2)

15 Macro set button (green) (75)

16 Zoom lever (74)

17 Focus ring

18 Lens hood (75)

19 Display window (125)

20 DATE (+)/TIME (NEXT)/DATA CODE buttons ㉘, ㉟, (62)
Use these buttons to set the date and time, display the date and time, or display the data code.

21 CONTROL dial (69)
Move up or down to select the desired parameters during programmed AE mode and manual adjustment mode.

22 PROGRAM AE (programmed auto exposure) button (99)

23 AUTO LOCK switch
To adjust the aperture, gain, focus, white balance automatically and the shutter speed locked to 1/50, set to AUTO LOCK.

24 IRIS button (102)

25 SHUTTER SPEED button (102)

26 EJECT (cassette eject) button ㉙

27 BATT (battery eject) knob ㉒

28 Cassette holder

29 SUPERIMPOSE buttons (79)
TITLE 1 button
TITLE 2 button
MEMORY button
COLOR/MODE button

30 WHT BAL (white balance) button (71)

31 ◺■◺ **(one-push white balance) button (72)**

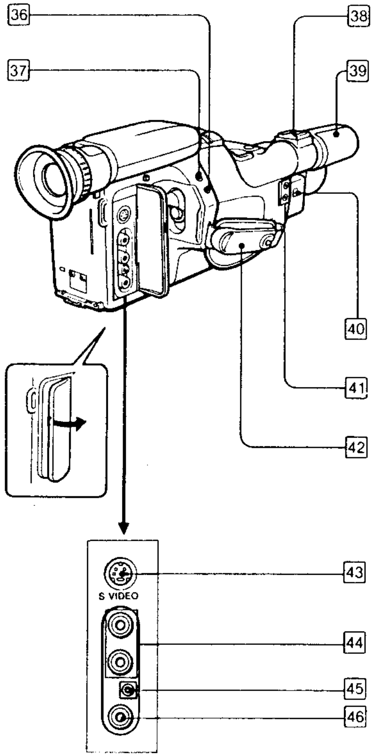
32 FOCUS button (68)

33 PUSH AUTO button (69)

34 GAIN button (102)

35 FADER button (76)

(D-3)



(D-3)

36 ∩ (headphones) jack (stereo minijack)

37 REMOTE connector (stereo mini-minijack)
Connect a wired remote control unit, a editing controller (not supplied), etc.

38 Accessory shoe
Attach a video light, external microphone, (not supplied), etc.

39 Built-in one-point stereo microphone

40 BUILT-IN MIC (microphone)/WIND selector ㉟

41 EXT MIC and DC OUT (microphone power output) jack
Connect an external microphone (not supplied). The DC OUT jack supplies power to it.
When connecting "plug-in-power" microphones, use the MIC jack only.

42 Grip strap ㉜

43 S VIDEO OUT connector (4-pin mini DIN connector)

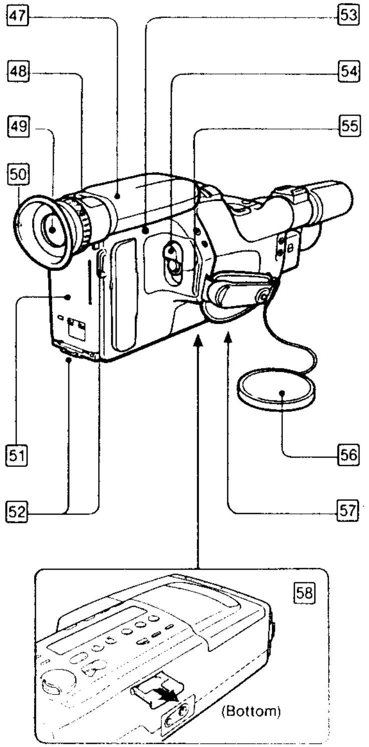
44 AUDIO OUT L/R jacks (phono jacks) ㊹, (117)

45 RFU DC OUT (RFU adaptor DC output) jack (special minijack) ㊺
Attach the supplied RFU adaptor here.

46 VIDEO OUT jack (phono jack) ㊹, (117)

About the (LANC) mark
(LANC) stands for Local Application Control Bus System. The (LANC) connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

(D-4)



(D-4)

47 Viewfinder
The picture being recorded or played back can be monitored in black and white in here.
Caution indicators, tape operation modes, function modes, menu are also displayed.

48 Viewfinder lens adjustment ring ㉚

49 Sports finder
You can look through the finder without touching your eye to it.

50 Eyecup

51 Battery mounting surface ㉒

52 Hooks for shoulder strap

53 PUSH SLIDE button
Press this button and slide the viewfinder to the desired position.

54 STANDBY switch
Slide up to set the camcorder to the standby mode.

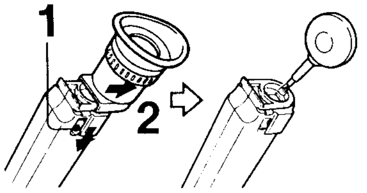
55 START/STOP button
Press to start and stop camera recording.

56 Lens cap

57 Tripod receptacle (bottom)

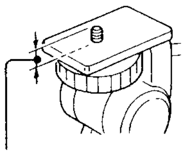
58 Lithium battery compartment (bottom) ㉗

(D-5)



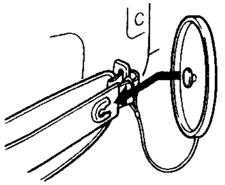
To remove the dust from inside the sports finder (D-5)
Detach the eyecup as illustrated and clean the surface of the screen with a blower.

(D-6)



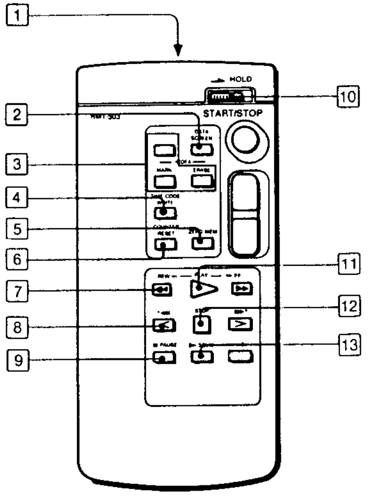
Note on attaching a tripod (D-6)
When attaching a tripod other than Sony's, make sure that the length of the camera mounting screw is less than 6.5 mm. Otherwise, the screw may damage the inner parts of the camcorder.

(D-7)



When the lens cap is removed (D-7)
Attach the lens cap to the grip strap.

(D-8)



Wireless Remote Commander

(D-8)

You can record or play back a tape from a distance. The buttons on the Commander with the same name or mark as those on the camcorder have the same function. The buttons with an asterisk (∗) is available on the Commander only.

When you use the Commander
Be sure to select "COMMANDER ON" in the MODE SET menu (page 41 and 59) and then start operating the camcorder. Point the Commander to the remote sensor on the camcorder.

1 **Transmitter**

2 **DATA SCREEN button (59)**

3 **INDEX buttons ㊴, (53)**
INDEX button*
INDEX MARK button
INDEX ERASE button*

4 **RC TIME CODE WRITE button* (64)**

5 **ZERO MEM (memory) button ㊲, (52)**

6 **COUNTER RESET button ㊲, (52)**

7 **◀◀ REW (rewind) button ㊼**

8 **</◀II (reverse direction/reverse frame) button ㊽**

9 **II PAUSE button ㊽**

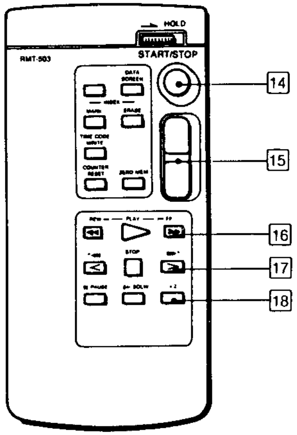
10 **HOLD switch***
Slide in the direction of the arrow to prevent the buttons from being accidentally depressed.

11 **▷ PLAY button ㊼**

12 **■ STOP button ㊼**

13 **I▶ SLOW button ㊽**

(D-9)



(D-9)

14 **START/STOP button**
Press to start and stop camera recording.

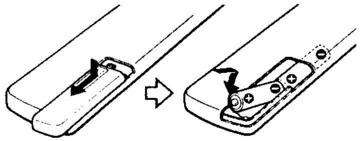
15 **Power zoom button** ㉘

16 **▶▶ FF (fast forward) button** ㊼

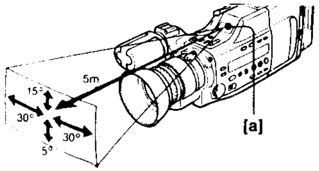
17 **>/❚❚▶ (forward direction/forward frame) button** ㊾

18 **X 2 button*** ㊽
Provided only on the Commander.

(D-10)



(D-11)



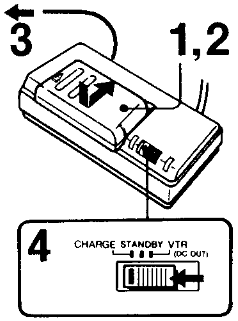
Inserting batteries
(D-10)
Insert two R6 (size AA) batteries with polarity positioned correctly.

Remotely controllable range
(D-11)
Point the Commander towards the remote sensor. **[a]**

Notes on the Remote Commander

- The batteries will last for about six months under normal operation. However, if the Commander will not be used for a long period, remove the batteries to avoid possible damage from battery leakage.
- Do not let direct sunlight or strong light source light the camcorder's remote control sensor. Remote control with the Commander may not be effective.
- The command mode of the Commander is VTR 2. Avoid using Sony VTRs with the same command mode at the same time.

(E-1)



Connecting the Power Sources

First Choose the Power Source

Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-66H (supplied), NP-77H NP-77, or NP-55
	Alkaline batteries	Battery case EBP-55, or EBP-77
Indoors	House current	AC power adaptor AC-V35/ V35A (supplied), AC-V30, or AC-V55
In the car	12 V or 24 V car battery	DC pack DCP-77, or AC power adaptor AC-V55 and car battery cord DCC-16AE

Note on power sources
Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. If disconnected, supply the power again immediately.

Using the Battery Pack

Step 1
Charge the battery pack. **(E-1)**

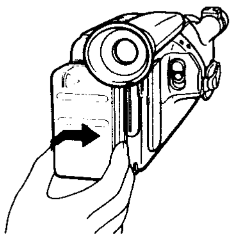
1. **Align the groove on the battery pack with those on the AC power adaptor.**
2. **Slide in the battery pack to the right as illustrated.**
3. **Connect the AC power adaptor to a wall outlet.**
4. **Set the CHARGE/VTR selector to CHARGE.**
Charging begins.

	NP-66H (supplied)	NP-55	NP-77	NP-77H
Required charging time	100	60	120	140

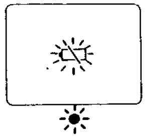
(approx. minutes using AC-V35/V35A)

Refer to the operating instructions of the AC power adaptor for details.

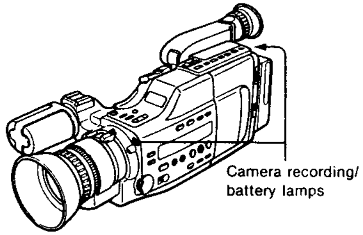
(E-2)



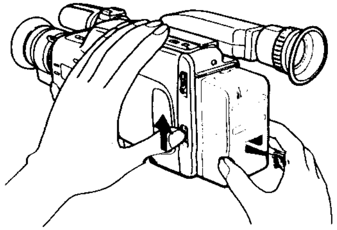
(E-3)



(E-4)



(E-5)



Step 2
Mount the battery pack on the camcorder. **(E-2)**

1. **Align the right side of the battery pack with the line on the camcorder.**
2. **Slide in the battery pack to the right as illustrated.**

Notes
- Make sure that the battery fits completely on the mounting surface of the camcorder.
  Imperfect mounting may damage the projections of the camcorder.
- If your nose touches the battery pack, adjust the position of the viewfinder by sliding it while pressing PUSH SLIDE.

Battery life
A fully charged battery pack lasts for:

	NP-66H (supplied)	NP-55	NP-77	NP-77H
Battery life	65	35	70	90

(approx. minutes, continuous recording when used indoors)

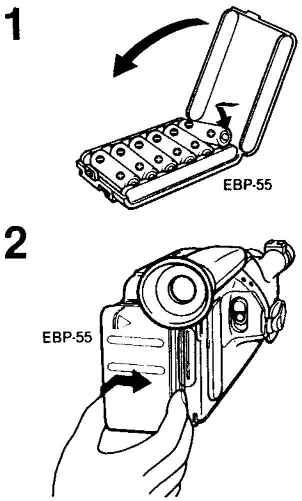
When the battery becomes weak, the ⌧ indication, the red lamp in the viewfinder **(E-3)** and the camera recording/battery lamps **(E-4)** blink. Replace the battery pack with a fully charged one.

To remove the battery pack
(E-5)
Hold the BATT knob up, and slide the battery pack to the left.

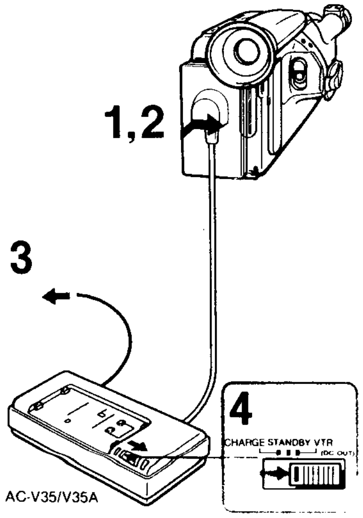
Other options
- AC-V55 AC power adaptor:
  You can charge two battery packs.
- BC-55, BC-77 portable battery charger:
  You can charge a battery pack on 100 – 240 V AC.
- DC-V30 car battery pack:
  You can charge a battery pack by connecting the car battery charger to the cigarette lighter socket.

If you have an NP-4000
You can use it for long outdoor recording.

(E-6)



(E-7)



Using Alkaline Batteries

(E-6)

The battery case EBP-55 or EBP-77 (not supplied) is required.
Manganese batteries cannot be used with the battery case.

1. **Insert R6 (size AA) alkaline batteries into the battery case.**
   (6 batteries for EBP-55 and 12 batteries for EBP-77)
2. **Attach the battery case in the same way as the battery pack.**

Battery life

	EBP-55	EBP-77
Battery life	35	95

(approx. minutes, continuous recording when used indoors)

To remove the battery case
Proceed in the same manner as the battery pack.

Notes on battery life while using the battery case
- Batteries do not last long in cold places.
- No indication appears in the viewfinder to warn of a weak battery.

Using the House Current

(E-7)

The supplied AC-V35/V35A AC power adaptor is required.

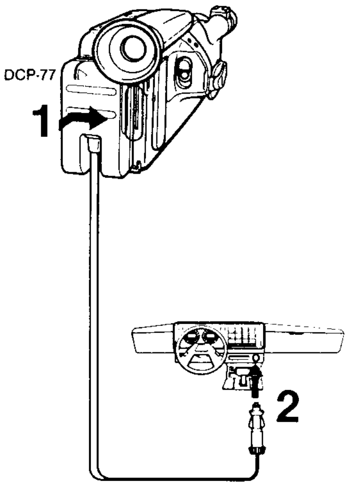
1. **Align the right side of the connecting plate with the line on the camcorder.**
2. **Slide in the connecting plate to the right.**
3. **Connect the AC power adaptor to a wall outlet.**
4. **Set the CHARGE/VTR selector on the AC power adaptor to VTR.**

See the operating instruction of the AC power adaptor for further information.

To remove the connecting plate
Proceed in the same manner as the battery pack.

Other power sources
The AC-V30 or AC-V55 AC power adaptor can also be used.

(E-8)



Using the Car Battery

(E-8)

The DCP-77 DC pack (not supplied) is required.

1 **Align the right side of the DC pack with the line on the camcorder and slide it to the right.**

2 **Connect the car battery cord to the cigarette lighter socket of a car (12 V or 24 V).**

To remove the DC pack

Proceed in the same manner as the battery pack.

Other options

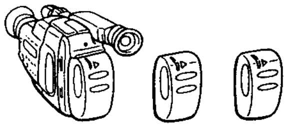
The AC-V55 AC power adaptor and the DCC-16AE car battery cord can also be used to operate this camcorder on a 12 V or 24 V car battery.

Using the Best of the Battery Pack

How to prepare the rechargeable battery packs

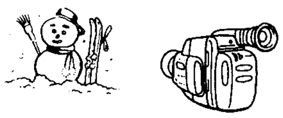
Have a sufficient battery pack power to perform 2 or 3 times as much recording than you have planned.

"Battery life" as indicated in the instruction manual or catalogue of the camcorder is measured by the continuous recording time of the camcorder, placed at a room temperature using a full-charged battery.



Battery life is shorter in a cold climate.

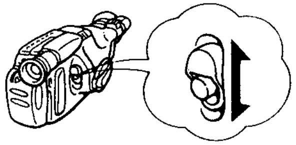
Battery efficiency is decreased and the battery will be used up more quickly.



Turn the STANDBY switch of the camcorder off when not recording to save battery power.

A smooth recording can be made even if recording is stopped and started again.

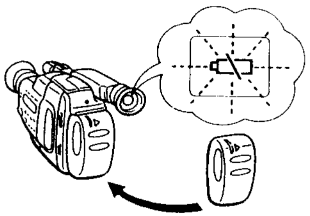
While positioning the subject, selecting an angle, or looking through the viewfinder, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.



When the rechargeable battery pack should be replaced

When the ▭ mark in the viewfinder changes from slow blinking to rapid blinking while you are recording.

Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth recording after the battery pack is replaced.

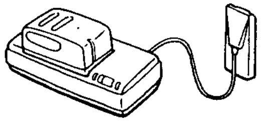


Notes on charging

Before using the battery pack, charge it sufficiently. A brand-new battery pack is not charged.

Recharge the battery pack when it is exhausted.

- If recording is completed before the ▭ mark appears in the viewfinder, it is recommended that you remove the tape, set POWER to CAMERA, slide up STANDBY, and leave the camcorder until the ▭ mark blinks rapidly.
- **Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you fully discharge and fully charge the battery again.**



Recharge the battery pack before using.

If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged.

Charge it again but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Keep the terminals clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.

When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition Also wipe the + and – terminals with a soft cloth or paper.

Notes on the rechargeable battery pack

Why the battery pack heats up

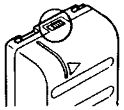
During charging or recording, the battery pack heats up. This means energy has been generated and a chemical change has occurred inside the battery pack, but this is not dangerous.

How to care for the battery pack

- Remove the battery pack from the camcorder after using it, and keep it in a cool place.
  When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is turned off. It causes overdischarging and will shorten battery life.
- The battery pack is always discharging even when it is not in use after charging. Thus, it is recommended you charge the battery before using.

How to use the switch on the battery pack

This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.



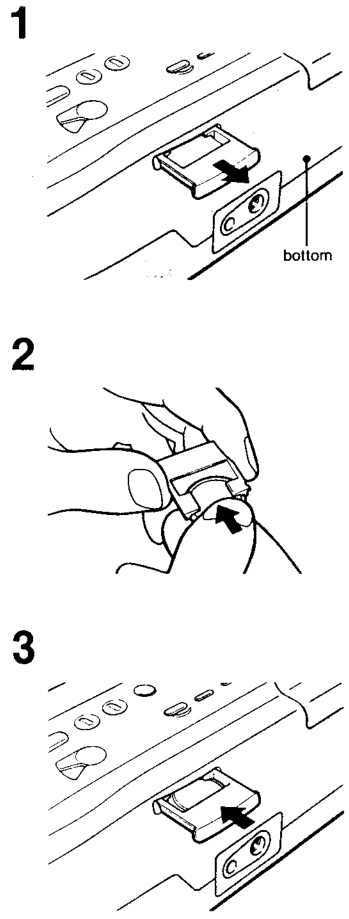
How many times can the battery pack be recharged

It can be fully charged and discharged about 500 times under normal temperatures. If the ▭ mark blinks rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully caharged one.

Temperature during charging

Lower temperature require a longer charging time. Charging under temperatures ranging from 10°C to 30°C is recommended.

(F-1)



Setting the Date and Time

Inserting the Lithium Battery

(F-1)

This camcorder uses a lithium battery to activate the clock and to keep the titles in the memory.

Install the supplied lithium battery before operating it for the first time.

1 **Pull out the lithium battery holder from the bottom of the camcorder.**

2 **Install the supplied CR2025 lithium battery with the + side downwards.**

3 **Install the lithium battery holder to the bottom of the camcorder.**

To remove the lithium battery

Pull out the lithium battery holder from the bottom of the camcorder and pull out the lithium battery.

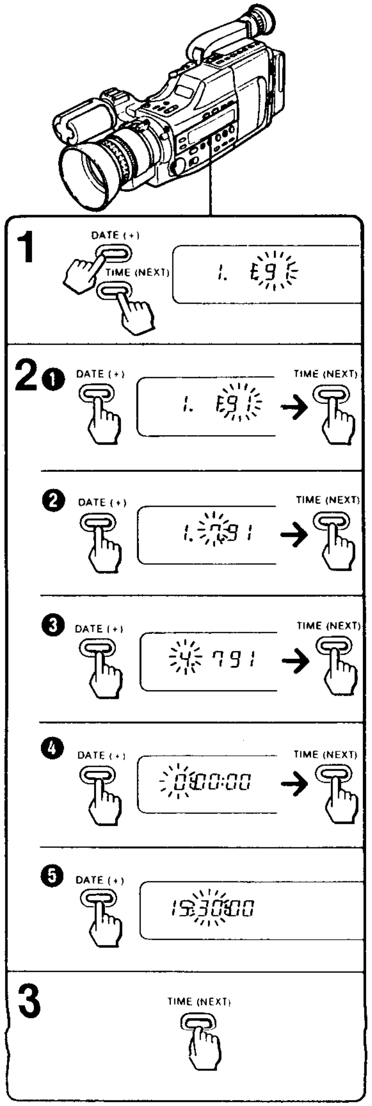
Note on lithium battery life

The battery lasts for approximately 1 year under normal operation. When the lithium battery becomes weak, the time indication keeps blinking in the display window and blinks in the viewfinder for about 5 seconds when the POWER switch is set to CAMERA. **In this case, keeping the battery pack or another power source connected, replace the battery with a Sony CR2025. Use of another battery may present a risk of fire or explosion.** If the battery pack or other power sources were not connected during lithium battery exchange, readjust the date and time after installing a new battery.

Cautions

- Keep the lithium battery out of the reach of children.
  Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

(F-2)



Setting the Date and Time

(F-2)

Before you begin

- Check that a power source is installed to the camcorder.
- Set the POWER switch to CAMERA or OFF.

Operation

1 **Press DATE (+) and TIME (NEXT) simultaneously for more than 3 seconds.**
The date indication blinks in the display window. The DATE button now functions as + (advance the number) and the TIME button functions as NEXT (execute). If you went passed the desired number, keep pressing the + button. The number eventually returns to the original one.

2 **Adjust the year ❶, month ❷, day ❸, hour ❹, and minute ❺ in this order.**
First, adjust the blinking digits with +, and then press NEXT.

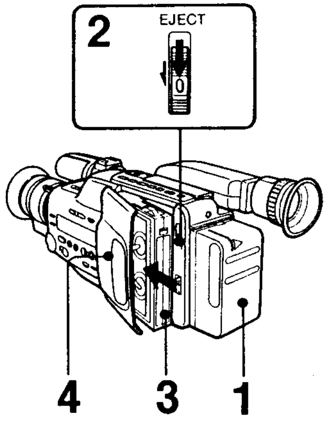
3 **Press NEXT to set the seconds to "00".**
The clock starts operating.

To correct date and time setting
Repeat steps 2 and 3.

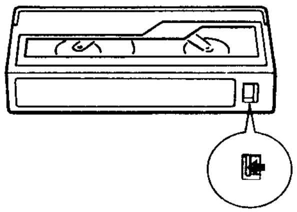
To advance the digits faster
Keep pressing +.

To check the preset date and time
Press DATE or TIME. When you press the same button again, the indication is changed to the counter indication.

(G-1)



(G-2)



Inserting Tapes

(G-1)

1 **Check that a power source is installed.**

2 **Press and slide the EJECT button.**
The cassette holder automatically opens. Do not open it forcibly while it is moving.

3 **Insert a cassette with the window facing outside.**

4 **Press the PUSH mark to close the cassette holder.**

Ejecting the Tape

1 **Check that a power source is connected.**

2 **Press and slide the EJECT button.**
The cassette holder automatically opens.

3 **Take out the tape.**

4 **Press the PUSH mark to close the cassette holder.**

Preventing Accidental Erasure

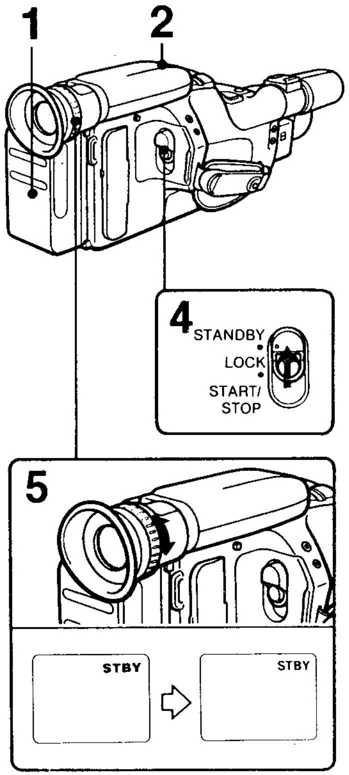
(G-2)

Slide the tab in exposing the red mark on the cassette. This will prevent recording. To re-record on this tape, slide the tab back out covering the red mark.

Notes on cassette handling

- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type and thickness of the tape, or if the red mark is exposed or covered, etc.
- Store tapes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.
- Store tapes in their cases and keep them away from heat, humidity, direct sunlight, magnetic fields, dust and mold.

(H)



Adjusting the Viewfinder Lens

(H)

The position of the viewfinder lens for optimum vision varies depending upon the person. Adjust it when using the camcorder for the first time, or when using it after someone else.

1 **Check that a power source is installed.**

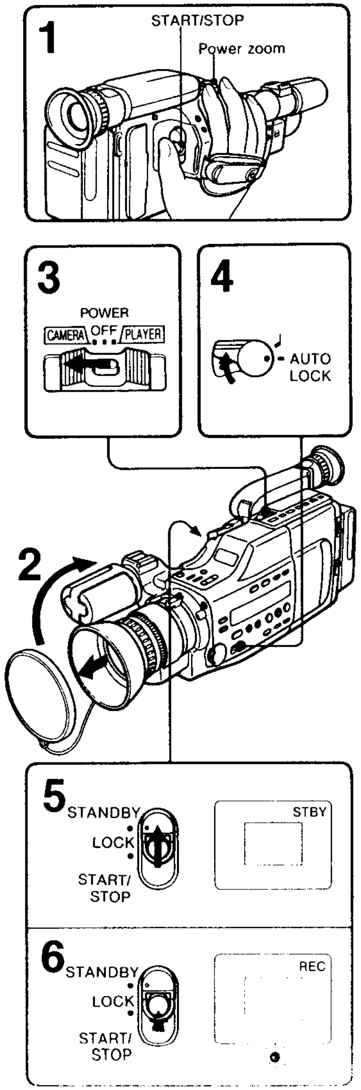
2 **Hold down the green button and slide the POWER switch to CAMERA.**

3 **Insert a cassette.**

4 **Slide the STANDBY switch up.**

5 **Turn the viewfinder lens adjustment ring so that the "STBY" indication in the viewfinder comes into focus.**

(I-1)



Recording a Picture with the Automatic Adjustments

(I-1)

Before recording "once-only" events, we strongly recommend making a trial recording and checking that everything is working perfectly.

1 **Hold the camcorder as illustrated.**
Put your hand through the grip strap and check that your thumb easily touches the START/STOP button.

2 **Remove the lens cap and attach it to the grip strap.**

3 **Hold down the green button and slide the POWER switch to CAMERA.**

4 **Set the AUTO LOCK switch to AUTO LOCK and turn the zoom lever downwards.**

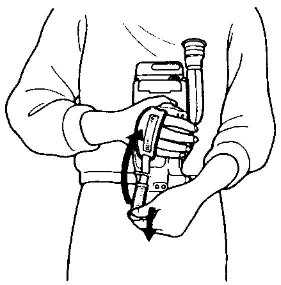
5 **Slide the STANDBY switch up.**
"STBY" and the auto-focus frame appear in the viewfinder. The camcorder is now set to the recording standby mode. The automatic focusing functions within the objects inside the auto-focus frame. Do not turn or stop the focus ring forcibly.

6 **Press the START/STOP button.**
"REC" appears and the red lamp lights in the viewfinder. The camcorder is recording.

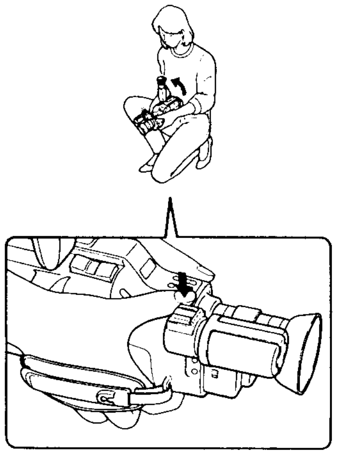
To stop recording momentarily
Press the START/STOP button again. The camcorder enters the standby mode with "STBY" indication in the viewfinder.

To stop recording
Slide the STANDBY switch down and set the POWER switch OFF.

(I-2)



(I-3)



How to fix the grip strap

(I-2)
In step 1 on the previous page, hold the camcorder pressed to your body and pull the grip strap upwards.

When the viewfinder touches your nose
Press the PUSH SLIDE button and slide the viewfinder to the desired position.

For low-position shooting

(I-3)
The viewfinder can be turned up 90 degrees. Press the REC START/STOP button in the front of the camcorder instead of the START/STOP button to start and stop the camera recording.

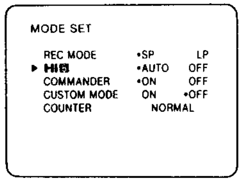
Notes on recording
- To record from the beginning of the cassette, run the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- If the POWER switch is moved during recording, the tape will stop.
- When moving from indoors to outdoors, or vice versa, slide the STANDBY switch up and point the camcorder at a white object for about 15 seconds so that the white balance is properly adjusted.

Note on standby mode
If you leave the camcorder in the standby mode for 5 minutes or more, the camcorder will automatically be turned off. To resume the standby mode, slide the STANDBY switch down once and slide it up again. To start recording, press the START/STOP button.

Note on the microphone
The microphone is fixed to the camcorder. Do not turn the microphone or hold the camcorder by the microphone. This may damage the camcorder.

Notes on light sources
- A vertical band may appear when a subject such as a candle flame or a light is shot against a dark background.
- If you shoot an object under bright lighting conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder to another direction.

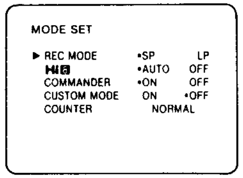
(I-4)



```
MODE SET

  REC MODE      •SP      LP
▶ Hi8           •AUTO   OFF
  COMMANDER     •ON     OFF
  CUSTOM MODE    ON    •OFF
  COUNTER        NORMAL
```

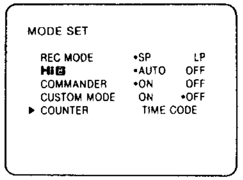
(I-5)



```
MODE SET

▶ REC MODE      •SP      LP
  Hi8           •AUTO   OFF
  COMMANDER     •ON     OFF
  CUSTOM MODE    ON    •OFF
  COUNTER        NORMAL
```

(I-6)



```
MODE SET

  REC MODE      •SP      LP
  Hi8           •AUTO   OFF
  COMMANDER     •ON     OFF
  CUSTOM MODE    ON    •OFF
▶ COUNTER        TIME CODE
```

How to record in the Hi8 mode

(I-4)
The camcorder is set to record in the AUTO mode which automatically records in the Hi8 mode when a Hi8 tape is used. To record in the standard mode with the Hi8 tape, change the setting in the menu.
See "Using the Menu during Camera Recording" on page 41. On the playback compatibility of Hi8 tape and standard tape refer to page 7.

When recording a long continuous programme

(I-5)
The camcorder is set to record in the SP (Standard play) mode. To record a long continuous programme, change the setting in the menu to the LP (Long play) mode. In the LP mode, you can record as twice long as in the SP mode. See "Using the Menu during Camera Recording" on page 41. Also, be sure to have a sufficient battery pack.

How to display the RC time code during recording

(I-6)
During camera recording, the RC time code and data code (recording date and time) are automatically recorded on the tape. If you want to display the RC time code in the viewfinder and display window during recording, change the setting of the COUNTER mode to TIME CODE. See "Using the Menu during Camera Recording" on page 41.
To record the RC time code on a prerecorded tape, see page 64.

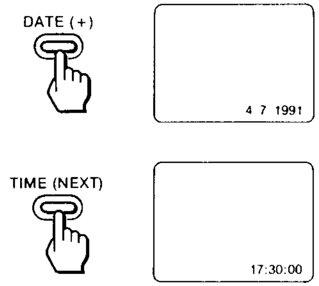
Note
The data code cannot be displayed during recording.

Brightness Levels

The single greatest influence on picture quality is the brightness level. Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording.

Snow-covered mountains Snow fields Sandy beach, clear day in summer	Unit: lux	ND filter recom-mended
Clear day, mid-day (100,000) Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)	100,000	Normal Recording
	10,000	
Overcast day, one hour after sunrise (2,000) Office lit by fluorescent lamps, near window (1,000) Clear day, one hour before sunset (1,000) Department store counter (500 – 700)	1,000	
Station wicket (650) Office lit by fluorescent lamps (400 – 500)	500	
Room lit by two 30 W fluorescent lamps (300) Subway station platform (300)	300	
Arcade at night (150 – 200)	100	
Theater lobby (15 - 35) Candlelight (10 - 15)	10	Video light recom-mended

(I-7)



To Record Date or Time

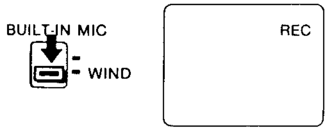
(I-7)

1 **Set the camcorder in the camera recording standby or camera recording mode.**

2 **Press the DATE button to indicate the date or the TIME button to indicate the time.**
The date or time displayed in the viewfinder will be recorded together with the picture.

To stop recording date or time
Press the DATE or TIME button. The indication is cleared and the recording continues.

(I-8)

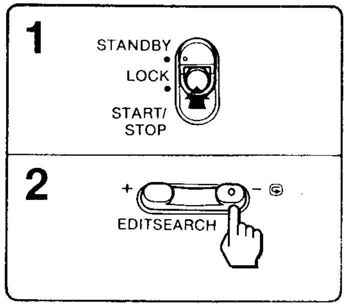


When there is Strong Wind

(I-8)

Set the BUILT-IN MIC selector to WIND.
The noise resulting from the wind will be reduced.
After recording, set it to the upper (green) position.

(I-9)



To Check the Last Portion of the Recording

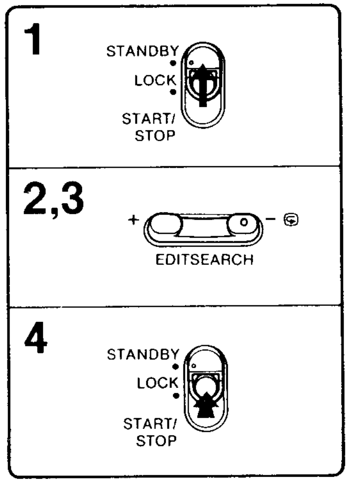
(I-9)

1 **Set the camcorder in the recording pause mode by pressing the START/STOP button.**

2 **Press the ⊖ side of the EDITSEARCH button.**
The last few seconds of the recorded portion is rewound and then is played back in the viewfinder. After a few seconds of playback, the camcorder returns to the recording pause mode.

If the picture was not recorded
the video heads may be contaminated. Clean the heads using the Sony V8-25CLH video head cleaning cassette or the equivalent.

(I-10)


1
STANDBY
LOCK
START/
STOP
2,3
+
−
EDITSEARCH
4
STANDBY
LOCK
START/
STOP

To Re-record on a previously Recorded Portion

(I-10)

1 Slide the STANDBY switch up.
The camcorder enters the standby mode.

2 Look in the viewfinder and search for the point from where you want to begin the recording.
Keep pressing the + side of the EDITSEARCH button to advance the picture at a normal playback speed or the − side to reverse the picture.

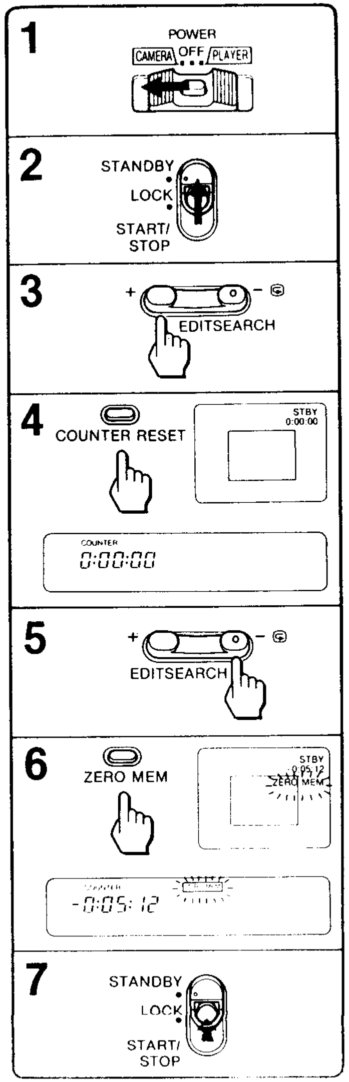
3 At the desired point, release the EDITSEARCH button.

4 Press the START/STOP button to start recording.

As long as the tape is not removed, the re-recorded picture will be smoothly connected even if the STANDBY switch is slid down and slid up again, or the power is turned off and on.

To stop recording
Slide the STANDBY switch down.

(I-11)


1
POWER
CAMERA
OFF
PLAYER
2
STANDBY
LOCK
START/
STOP
3
+
−
EDITSEARCH
4
COUNTER RESET
STBY
0:00:00
COUNTER
0:00:00
5
+
−
EDITSEARCH
6
ZERO MEM
STBY
0:05:12
ZERO MEM
-0:05:12
7
STANDBY
LOCK
START/
STOP

To Re-record a Picure in the Middle of a Recorded Tape (Insert Recording)

(I-11)

- Make sure that the COUNTER mode is set to NORMAL in the menu. (See page 41.)

1 Hold down the green button and slide the POWER switch to CAMERA.

2 Slide the STANDBY switch up.
The camcorder enters the recording standby mode.

3 While looking in the viewfinder, keep pressing the + or − side of the EDITSEARCH button and release it at the point where the insertion should end.

4 Press the COUNTER RESET button.
The counter is reset to "0:00:00".

5 While looking in the viewfinder, keep pressing the − side of the EDITSEARCH button and release the button at the point where the insertion should start.

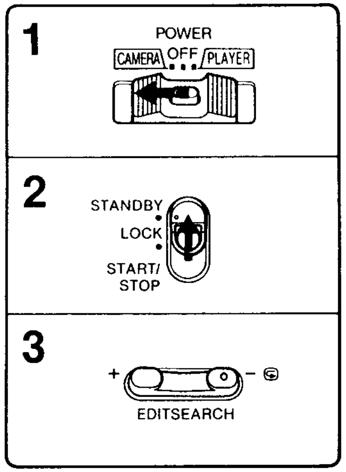
6 Press the ZERO MEM buttton.
The ZERO MEM indication blinks in the viewfinder and the display window.
The insert end point is stored in the memory.

7 Press the START/STOP button.
Insert recording starts. It stops automatically around the counter zero point.

To change the end point of the edit
Press the ZERO MEM button so that the ZERO MEM indication disappears. Start from step 3.

Note
The picture may be distorted at the end of the inserted portion when it is played back.

(I-12)



Playing Back the Picture Instantly

(I-12)

You can check the recorded picture in the viewfinder. The sound is not heard.

1 **Hold down the green button and slide the POWER switch to CAMERA.**

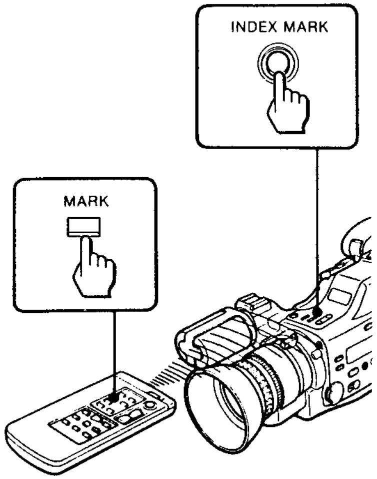
2 **Slide the STANDBY switch up.**

3 **Keep pressing the + or − side of the EDITSEARCH button to play back the picture.**
  + side: To view the playback picture.
  − side: To view the playback picture in reverse.

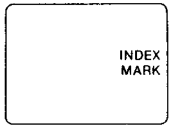
To stop playback
Release the EDITSEARCH button.

To monitor the sound while viewing the playback picture in the viewfinder
1 Connect the headphones to the ∩ jack.
2 Hold down the green button and slide the POWER switch to PLAYER.
3 Press ◀◀ to rewind the tape and press ■ where you want start playing back.
4 Press ▷ to start playback.

(J-1)



Viewfinder



Display window

Marking Index Signals

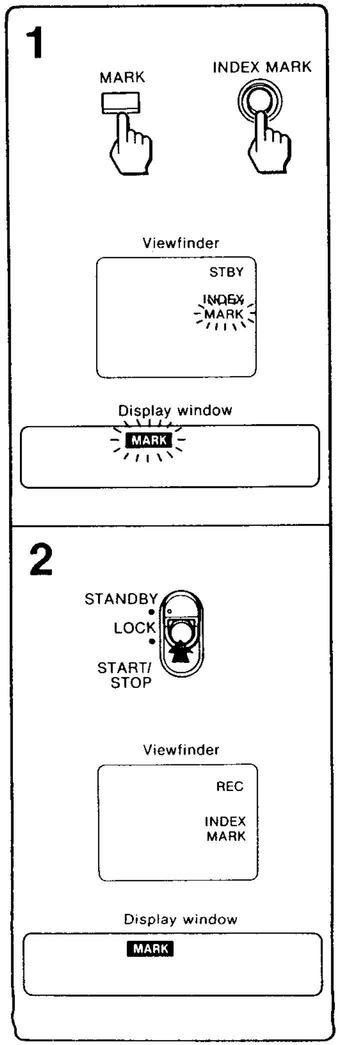
The beginning of the desired program can be located easily by marking an index signal and searching for it later.

To Mark an Index Signal during Camera Recording

(J-1)

Press the INDEX MARK button on the camcorder or the Commander at the point you wish to locate later.
The INDEX MARK indication appears in the viewfinder and MARK appears in the display window to indicate that the index signal is being marked.

(J-2)



To Mark an Index Signal at the Beginning of Camera Recording

(J-2)

1 **Press the INDEX MARK button on the camcorder or the Commander after setting the camcorder in the camera recording standby mode.**
The INDEX MARK indication appears in the viewfinder with MARK blinking and MARK blinks in the display window.

2 **Press the START/STOP button to release the camera recording standby mode.**
The MARK indication stops blinking to indicate that the index signal is being marked.

For other operations using the index signal
See page 54.

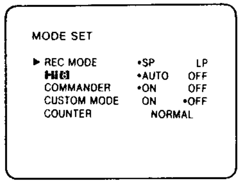
Notes

- The index signals can be marked at any desired point. But make sure there is more than 2 minutes of space between two index signals. If there are two or more index signals marked within an interval of 2 minutes on a normal tape run, these signals cannot be searched correctly.
- The INDEX MARK indication disappears automatically.
Continue to record until the INDEX MARK indication disappears so that the recorded index signal can be searched correctly in the playback mode.

Using the Menu during Camera Recording

MODE SET menu and CUSTOM PRESET menu can be used during camera recording. In the MODE SET menu, various settings to further enjoy the features of the camcorder can be selected. In the CUSTOM PRESET menu, the camcorder can be set to record in the desired picture tone.

(K-1)


```
MODE SET

▶ REC MODE     •SP     LP
  Hi8          •AUTO   OFF
  COMMANDER    •ON     OFF
  CUSTOM MODE   ON    •OFF
  COUNTER       NORMAL
```

MODE SET Menu

(K-1)

REC MODE SP/LP

- Select SP to record in the SP (Standard play, approximately 20.051 mm/second) mode.
- Select LP to record in the LP (Long play, approximately 10.058 mm/second) mode. It is useful for recording a long continuous programme.

Hi8 AUTO/OFF

- Select AUTO to set the recording mode (Hi8 or normal) automatically depending upon the tape being used.
- Select OFF if you wish to record in the normal mode regardless of the type of tape being used.

COMMANDER ON/OFF

- Select ON when using the supplied Commander for camera recording.
- Select OFF when the supplied Commander will not be used for camera recording or when you connect the receiver of the remote cntrol kit (not supplied) to the REMOTE control connector.

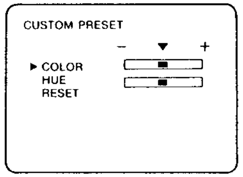
CUSTOM MODE ON/OFF

- Select ON to perform camera recording based on the setting made in the CUSTOM PRESET menu. See page 114.
- Select OFF to perform camera recording without the setting made in the CUSTOM PRESET menu.

COUNTER NORMAL/TIME CODE

- Normally set to NORMAL to display the linear time counter in the viewfinder and display window.
- Select TIME CODE to display the RC time code in the viewfinder and display window, and output from the REMOTE connector.

(K-2)

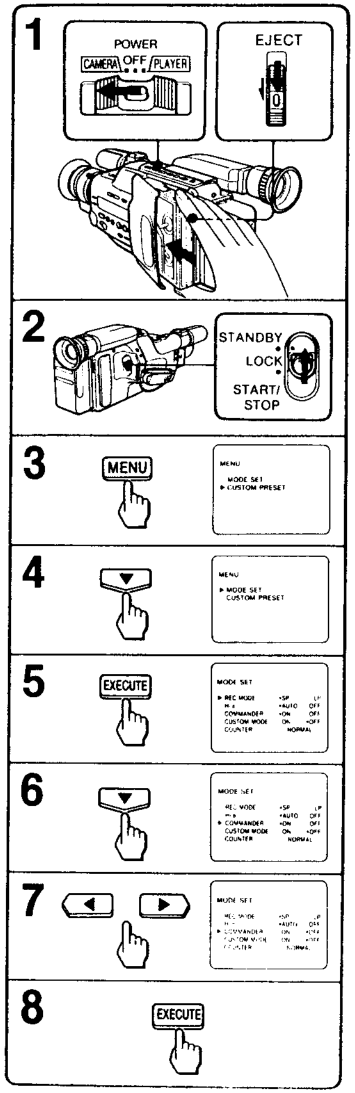

CUSTOM PRESET
– ▼ +
▶ COLOR
HUE
RESET

CUSTOM PRESET Menu

(K-2)

The camera can be preset to record in the desired picture using the CUSTOM PRESET menu. The items that can be preset are COLOR and HUE. See "Custom Preset Function" on page 114 for details.

(K-3)


1
POWER
CAMERA OFF PLAYER
EJECT
2
STANDBY
LOCK
START/STOP
3
MENU
MENU
MODE SET
▶ CUSTOM PRESET
4
MENU
▶ MODE SET
CUSTOM PRESET
5
EXECUTE
MODE SET
6
7
8
EXECUTE

How to Call Up the Menu Display

(K-3)

Press the DATA SCREEN button to display the menu on the TV screen.

Example: To select COMMANDER OFF.

1 **Set the POWER switch to CAMERA and insert a cassette.**

2 **Slide the STANDBY switch up.**

3 **Press the MENU button.**
The MENU display appears.

4 **Press ▼ and move cursor to the desired item.**

5 **Press the EXECUTE button.**
The selected menu appears.

6 **Press ▼ and move cursor to the desired item.**

7 **Press ◀ or ▶ to select the desired setting.**

8 **Press the EXECUTE button.**
The setting is stored in the camcorder and the menu display is cleared.

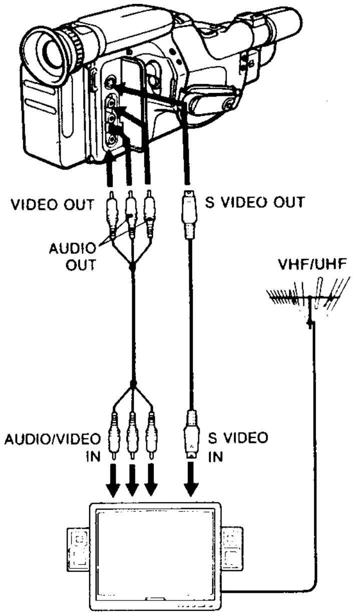
The setting is stored in the memory for about 5 minutes even if the POWER switch is set to OFF or the power source is removed, as long as the lithium battery is installed.

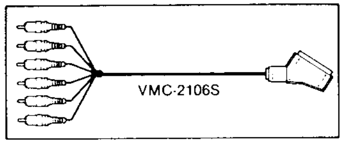
To display another menu
Start from step 1 in "How to Call Up the Menu Display."

To return to the original screen
Press the MENU button.

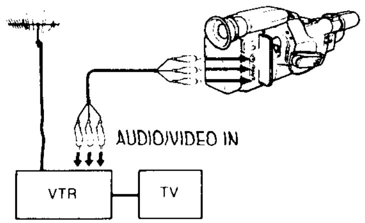
To make multiple settings within one menu
After step 7 in "How to Call Up the Menu Display", press ▼ and move cursor to the desired item.

(L-1)





(L-2)



Connections for Playback

To view the playback picture on the TV screen, the camcorder and TV and/or the VTR must be connected properly. Check the following connecting examples and go to the appropriate section to make the connections required.

Case 1:
Connecting the camcorder to a TV with video/audio input jacks.

Case 2:
Connecting the camcorder to a TV without video/audio input jacks.
For the camcorder supplied with the RFU-90E RFU adaptor.

Case 3:
Connecting the camcorder to a TV without video/audio input jacks.
For the camcorder supplied with the RFU-89EA RFU adaptor and the aerial selector.

Case 1: Connection to a TV with Video/ Audio Input Jacks

(L-1)

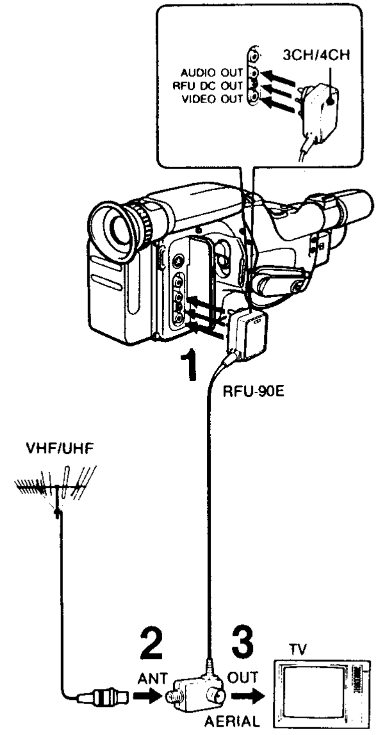
1 **Connect the camcorder and the TV using the supplied AV connecting cable.**
- If your TV has an S video input jack, connect the S VIDEO jack on the camcorder and the S video input jack on the TV using the supplied S VIDEO connecting cable.
- If your TV is a monaural type, connect only the white plug for audio on the TV and select "HIFI SOUND $\boxed{1}$" in the menu. See "Selecting the Monitor Sound" on page 51.
- If your TV has a 21-pin connector (EUROCONNECTOR), use a connecting cable such as the VMC-2106M (not supplied).

2 **Set the TV/VIDEO selector on the TV to VIDEO.**

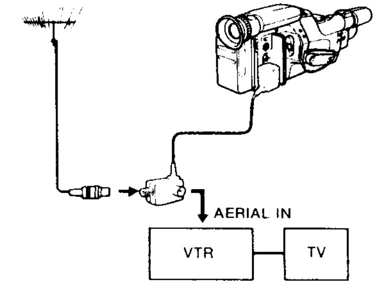
If your TV is connected to a VTR
(L-2)
Connect the camcorder to the VTR instead of the TV.

Note
For details on the TV, refer to the instruction manual of the TV.

(L-3)



(L-4)



Case 2: Connection to a TV without Video/Audio Input Jacks

For the comcorder supplied with the RFU-90E RFU adaptor.
(L-3)

Step 1
Connecting the camcorder, the RFU adaptor, and the TV.

1 **Connect the RFU adaptor to the camcorder.**

2 **Connect the aerial and the RFU adaptor.**

3 **Connect the RFU adaptor to the TV.**

Step 2
Selection of the TV programme position to monitor the camcorder playback.

1 **Set the RF unit selector on the RFU adaptor to either 3CH or 4CH, whichever is not active in your area.**

2 **Turn on the TV and select the 0 position.**

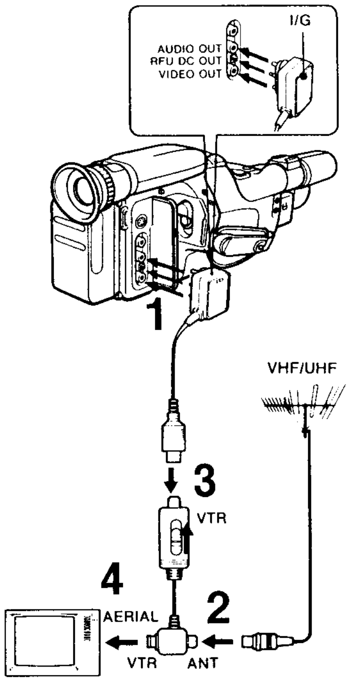
3 **Tune the TV so that picture and sound from the camcorder are received.**

Step 3
Whenever playing back a tape, be sure to set the TV to the 0 position.

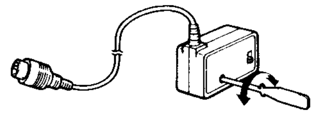
Notes
- In this connection, the sound will be in monaural.
- When you watch a TV programme, turn off the camcorder or disconnect the RFU adaptor from the camcorder.

If your TV is connected to a VTR
(L-4)
Connect the camcorder to the VTR instead of the TV.

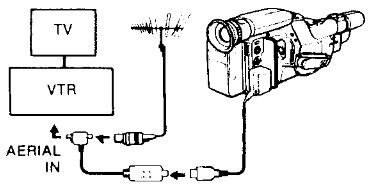
(L-5)



(L-6)



(L-7)



Case 3: Connection to a TV without Video/Audio Input Jacks

For the camcorder supplied with the RFU-89EA RFU adaptor and the aerial selector. (L-5)

Step 1
Connecting the camcorder, the RFU adaptor, and the TV.

1. **Connect the RFU adaptor to the camcorder.**
2. **Connect the aerial and the aerial selector.**
3. **Set the ANT/VTR selector on the aerial selector to VTR.**
4. **Connect the aerial selector to the TV.**

Step 2
Selection of the TV programme position to monitor the camcorder playback.

1. **Set the I/G selector on the RFU adaptor according to the TV system used in your area.**
2. **Turn on the TV and select a programme position that is not active in your area.**
3. **Set the POWER switch of the camcorder to CAMERA and slide the STANDBY switch up.**
4. **Tune the TV so that the picture and sound from the camcorder are received.**
   (For details, refer to the operating instructions of the TV.)

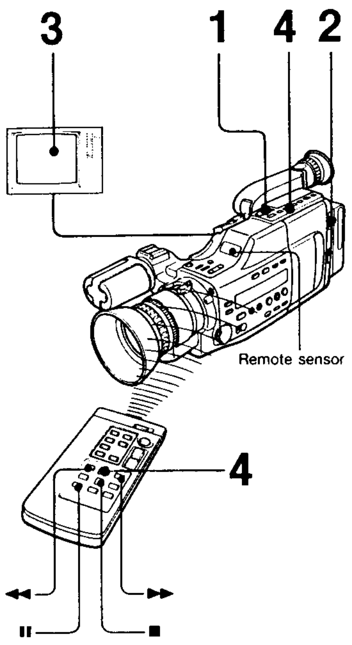
When the playback picture is not free of disturbance

1. **Set the ANT/VTR selector on the aerial selector to ANT.**
2. **Select a programme position between UHF channels 30 and 39, so that the TV shows no picture and a steady rustling sound or no sound is heard.**
3. **Set the ANT/VTR selector on the aerial selector to VTR.**
4. **Turn the screw on the RFU adaptor with the supplied screwdriver so that the playback picture is clearly displayed on the TV screen. (L-6)**

If your TV is connected to a VTR (L-7)
Connect the camcorder to the VTR instead of the TV.

Note
In this connection, the sound will be in monaural.

(M-1)



Playing Back a Tape

Use the buttons on the camcorder as well as the buttons on the Commander. The Commander is useful when operating the camcorder from a distance. Be sure to select COMMANDER ON in the menu before operation. (See page 59.)

Before You Begin

When you use the AC power adaptor, set the CHARGE/VTR selector to VTR.

Operation

(M-1)

1. **Hold down the green button and slide the POWER switch to PLAYER.**
2. **Insert a cassette.**
3. **Turn on the TV (and the VTR).**
   - For a TV with video/audio input jacks: Set the TV/VIDEO selector to VIDEO.
   - For a TV without video/audio input jacks: Select the programme position for playing back the camcorder.
4. **Press ▷.**
   Playback starts.
   The ▷ on the camcorder can also be used.

To view a still picture
Press ❚❚ during playback.

To resume playback
Press ▷ or ❚❚ again.

To stop playback
Press ■.

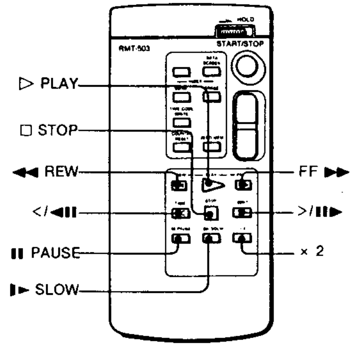
To rewind the tape
Press ◀◀.

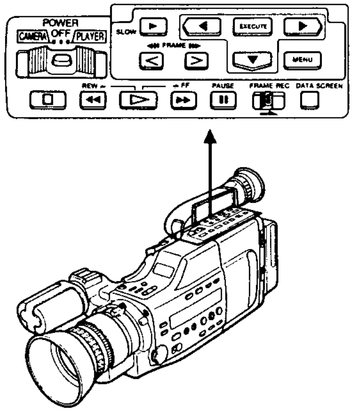
To advance the tape rapidly
Press ▶▶.

After playback
Set the POWER switch on the camcorder to OFF and the CHARGE/VTR selector on the AC power adaptor to STANDBY.

Notes
- When the still picture lasts for 5 minutes or more, the camcorder automatically enters the stop mode.
- This camcorder plays back a tape recorded in the SP and LP modes. The playback mode is automatically switched depending upon the mode of the recorded tape inserted.

(M-2)





Various Playback Modes

(M-2)

To view a still picture — playback pause

Press II during playback.
II◀ or ▶II appears in the viewfinder.
To resume normal playback, press ▷ or II.

To change the playback direction

Press </◀II for the reverse or >/II▶ for the forward direction during playback.
– × 1 or × 1 appears in the viewfinder.
To resume normal playback, press ▷.

To view the picture at 1/5 speed — slow playback

Set the playback direction with </◀II or >/II▶, and then press I▶ during playback.
◀I or I▶ appears in the viewfinder.
When slow playback lasts for 1 minute or more, forward or reverse playback at normal speed starts automatically, according to the tape direction.
To resume normal playback, press ▷.

To view the picture at double speed (Commander only)

Set the playback direction with </◀II or >/II▶, and then press × 2 on the Commander.
– × 2 or × 2 appears in the viewfinder.
To resume normal playback, press ▷.

To view the picture frame-by-frame

Press </◀II or >/II▶ in the still picture mode. Each press of the button moves the picture one frame. ◀II or II▶ appears in the viewfinder. If you keep pressing </◀II or >/II▶, playback at 1/30 speed starts.
To resume normal playback, press ▷.

To locate the desired scene — Picture search

Keep pressing ◀◀ or ▶▶ during playback in the still picture mode. (◀◀) or (▶▶) appears in the viewfinder.
To resume normal playback, release the button.

To locate the desired scene quickly — Skip scan

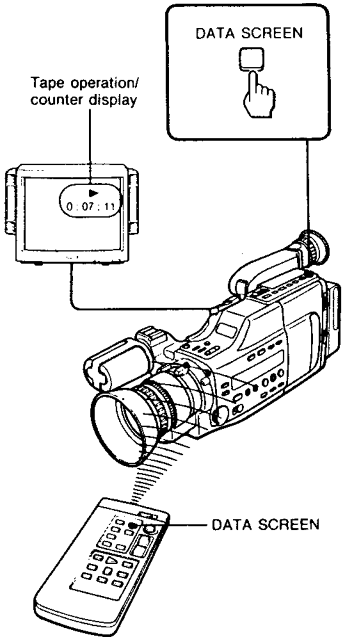
Press ◀◀ while rewinding or ▶▶ while advancing the tape rapidly. (◀◀) or (▶▶) appears in the viewfinder.
To resume normal playback, press ▷.

Notes during various playback
- Sound can be heard in the double speed forward playback, but is little noisy.
- Noise may appear in the still picture.
- Streaks may appear when pressing ◀◀ or ▶▶.
- The colour of the picture may change during still, frame-by-frame, slow or when using ◀◀ or ▶▶.
- The picture may shake vertically when playing back in speeds other than normal speed forward mode.

If picture is noisy during frame-by-frame or slow playback
Adjust the picture referring to "PICTURE ADJUST menu" (page 60) while playing back the tape in slow speed.
However, the noise may not be completely eliminated.

Notes on the RC time code or data code display
- "– – – –" (bars) may be displayed instead of the RC time code or data code during various playback modes.
- A horizontal noise band appears in the center of the screen during reverse playback.

(M-3)



Displaying the Information in the Viewfinder onto the TV Screen

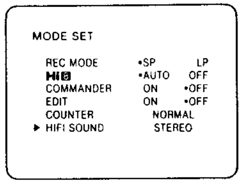
(M-3)

Connect the camcorder and the TV properly and press the DATA SCREEN button.
The indication in the viewfinder is superimposed on the TV screen. This function is convenient to monitor the indications in the viewfinder during menu operations or when the camcorder is remotely operated by the Commander.

To clear the indication
Press the DATA SCREEN button again.

Note
When using the camcorder as a playback VTR during editing, be sure to clear the indications from the TV screen. Otherwise, the indications will be recorded with the picture.

(M-4)



```
MODE SET

  REC MODE      •SP     LP
  Hi8           •AUTO   OFF
  COMMANDER      ON    •OFF
  EDIT           ON    •OFF
  COUNTER         NORMAL
▶ HIFI SOUND      STEREO
```

Selecting the Monitor Sound

(M-4)

The playback sound can be selected by the menu.
Refer to "Using the Menu during Playback" (page 59) for details.

When playing back a dual sound recorded tape
Normally set the HIFI SOUND setting to STEREO. When the dual sound recorded tape is played back, select 1 or 2 to hear the desired sound.

Note
Always return the setting to STEREO. Otherwise, the tape recorded in stereo will not be played back properly.

Note on PCM recording and playback
This camcorder cannot perform PCM recording or playback.

Using the Linear Time Counter

The linear time counter in the viewfinder and the display window indicates the elapsed time of the recording or playback.
To display the counter, set the COUNTER mode to NORMAL in the menu. (See page 59.)

To Index the Entire Tape

Press the COUNTER RESET button at the beginning of the tape so that the counter shows "0:00:00".
Write down the counter reading at a particular point so that you can easily find that point later by referring to the counter.

To Return to a Pre-registered Point

(N)

1 **During playback, press the COUNTER RESET button at the point to be located later.**

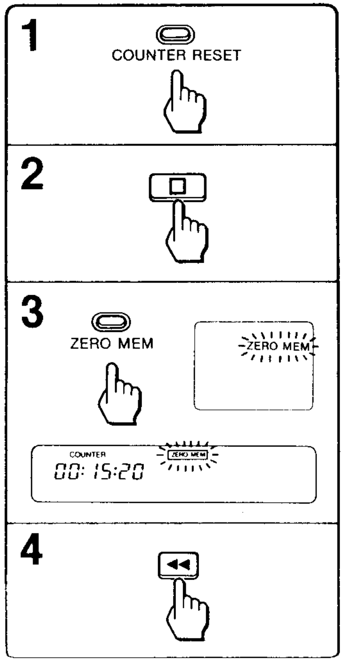
2 **Press ■ when the playback is finished.**

3 **Press the ZERO MEM button.**
The "ZERO MEM" indication blinks in the viewfinder and the display window.

4 **Press ◀◀.**
If the current counter reading is a minus number, press ▶▶.
The tape rewinds or advances and stops automatically when the counter reaches approximately "0:00:00".

To cancel the ZERO MEM function
Press the ZERO MEM button.

(N)



Notes on the linear time counter and the ZERO MEM button
- The counter reading and the actual point on the tape may not correspond exactly. Use the counter as a guide. There will be a lag of several seconds especially when fast-forward and rewind operation is repeated or when playing back a tape with both the SP mode and LP mode recording.
- Be sure to press the ZERO MEM button after the tape stops. It does not function during playback.
- The ZERO MEM mode is automatically canceled after each operation.

Notes on the RC time code and the ZERO MEM functions
- The COUNTER RESET and ZERO MEM buttons are not operative when the RC time code or data code is displayed. To use the ZERO MEM function, reset the COUNTER mode in the menu to NORMAL (See page 59).
- If you change the COUNTER mode from NORMAL to TIME CODE when the ZERO MEM indication blinks, the ZERO MEM mode is canceled.

Marking Index Signals during Playback

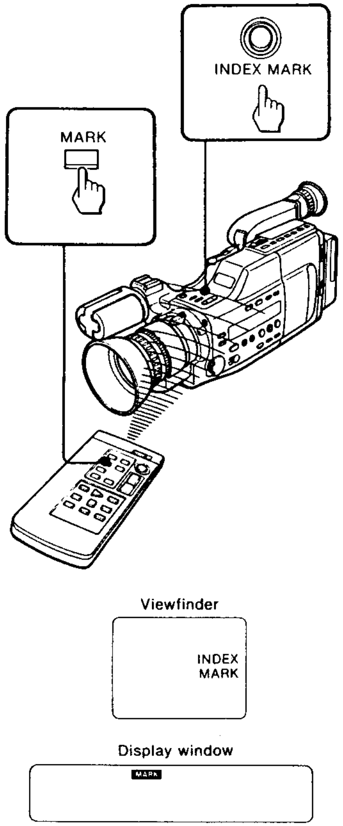
The beginning of the desired programme can be located easily be marking an index signal and searching for it later.

To Mark an Index Signal during Playback

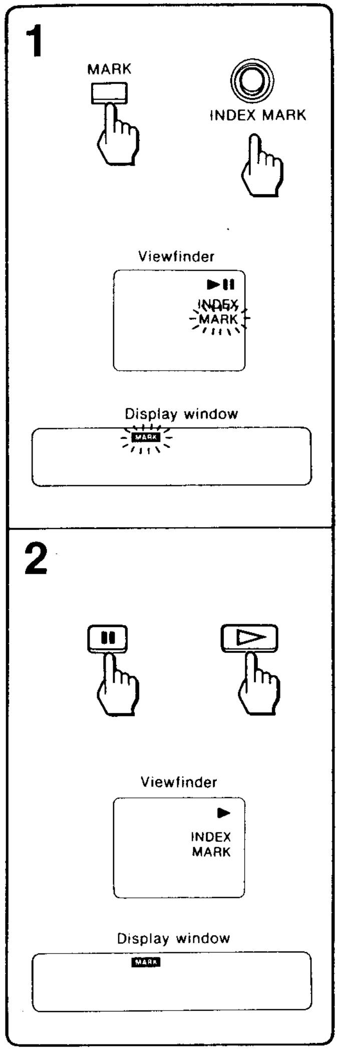
(O-1)

Press the INDEX MARK button on the camcorder or the Commander at the point you wish to locate later.
The INDEX MARK indication appears in the viewfinder and MARK appears in the display window to indicate that the index signal is being marked.

(O-1)



(O-2)



To Mark an Index Signal at the Beginning of the Playback

(O-2)

1 **Press the INDEX MARK button on the camcorder or the Commander in the playback pause mode.**
The INDEX MARK indication appears in the viewfinder with MARK blinking and MARK blinks in the display window.

2 **Press II or ▷ to release the playback pause mode.**
The MARK indication stops blinking to indicate that the index signal is being marked.

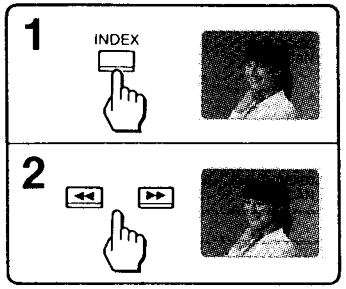
Notes

- The index signals can be marked at any desired point. But, make sure there is more than 2 minutes of space between two index signals. If there are two or more index signals marked within an interval of 2 minutes on a normal tape run, these signals cannot be searched correctly.
- The index signals cannot be marked on a tape with the red mark on the cassette exposed, or on a tape recorded in the LP mode.
- During index signal marking or erasing, a horizontal black band appears on the bottom of the TV screen and the sound is not heard. This does not affect the recorded picture and sound.

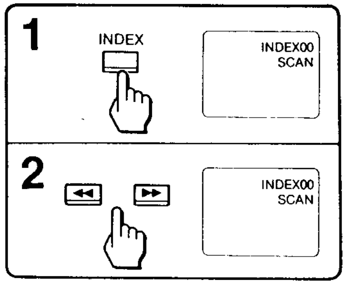
If an index signal is marked on a tape with the data code recorded

The camcorder erases the data code and marks the index signal instead. If you play back the portion of the tape on which the data code has been erased, the camcorder keeps displaying the data code immediately before the erased one. If the data code does not exist for more than 30 seconds, the data code display will then change to "– – – –" (bars).

(O-3)



(O-4)



Scanning or Searching the Beginning of a Programme during Playback

To scan the beginning of each programme while monitoring the picture — Index scan (1)
(O-3)

1 **Press the INDEX button on the Commander during playback or playback pause mode.**

2 **Press ◀◀ or ▶▶.**
The tape is played back for approximately 10 seconds from the point where the index signal was marked.

3 **Press ▷ when the desired programme is displayed to continue playback.**
When no button is pressed, the picture is automatically scanned to the next or previous programme.

To scan the beginning of each programme in sequence — Index scan (2)
(O-4)

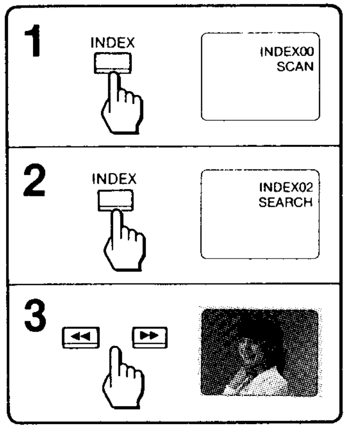
1 **Press the INDEX button on the Commander during stop mode.**

2 **Press the ◀◀ or ▶▶ button.**
The tape is played back for approximately 10 seconds from the point where the index signal is marked.

3 **Press ▷ when the desired programme is displayed to continue playback.**
When no button is pressed, the picture is automatically scanned to the next or previous programme.

To cancel the index scan mode
Press ▷.

(O-5)



To locate the desired programme — Index search
(O-5)

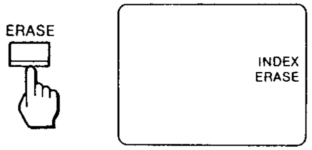
1 **Press the INDEX button on the Commander once during stop or playback mode.**

2 **Press the INDEX button on the Commander until the index number of the desired programme is displayed in the viewfinder.**

3 **Press ◀◀ or ▶▶.**
The playback starts from the beginning of the desired programme.

To correct the index number
Press ■ and repeat the steps above.

(O-6)



Erasing the Index Signals

(O-6)

1. **Locate the index signal to be erased by index scan or index search.**

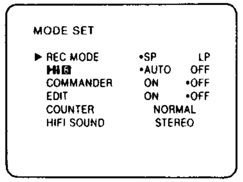
2. **Press the INDEX ERASE button on the Commander within approximately 10 seconds while the tape is being played back.**

3. **After the index signal is erased, the camcorder returns to index scan or index search, whichever was used in step 1.**

Notes when erasing index signals

- Press the INDEX ERASE button more than 2 seconds after the playback begins in step 2.
- The index signals cannot be erased if the red mark on the cassette is exposed.
- The recorded sound cannot be heard and a black band appears in the bottom of the picture while the index signal is being erased. This will not affect the recorded sound or picture.
- Index signals marked with VTRs such as the EV-S900E series can be detected but cannot be erased with this camcorder.
  Index signals marked with this unit can be detected but cannot be erased with VTRs such as the EV-S900E series.
- Index signal may be erased with VTRs such as the EV-S900E series when PCM after recording is made in the portion where the index signal is marked.
- While an index signal is erased, the RC time code and data code on the same portion of the tape are erased as well. The "– – – –" (bar) indication will appear when that portion is played back.
  To use that tape for editing using an editing controller, rewrite the RC time code referring to page 64.

(P-1)



```
MODE SET

▶ REC MODE     •SP       LP
  Hi8          •AUTO     OFF
  COMMANDER     ON      •OFF
  EDIT          ON      •OFF
  COUNTER        NORMAL
  HIFI SOUND     STEREO
```

Using the Menu during Playback

MODE SET menu and PICTURE ADJUST menu can be used during playback. In the MODE SET menu, various settings to further enjoy the features of the camcorder can be selected. In the PICTURE ADJUST menu, the picture in the still or slow mode can be adjusted.

MODE SET Menu

(P-1)

COMMANDER ON/OFF

- Select ON when using the supplied Remote Commander for playback.
- Select OFF when the supplied Remote Commander will not be used for playback or when you connect the receiver of the remote control kit (not supplied) to the REMOTE control connector.

EDIT ON/OFF

- Select ON when performing editing with the camcorder as the playback VTR to keep the degradation of picture resulting from editing to the minimum.
- Select OFF otherwise.

COUNTER NORMAL/TIME CODE

- Normally set to NORMAL to display the linear time counter in the viewfinder and display window.
- Select TIME CODE to display the RC time code or data code in the viewfinder and display window, and output the RC time code from the REMOTE connector.

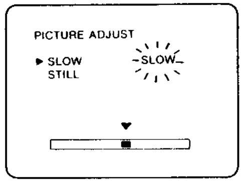
HIFI SOUND STEREO/1/2

- Normally select STEREO. The tape recorded in AFM Hi-Fi stereo will be played back in stereo.
- Select $\boxed{1}$ or $\boxed{2}$ to play back the desired sound of the dual sound recorded tape. See page 51.

Note

REC MODE SP/LP and **Hi8** AUTO/OFF setting can be selected during camera recording.

(P-2)


PICTURE ADJUST
▶ SLOW
STILL
SLOW

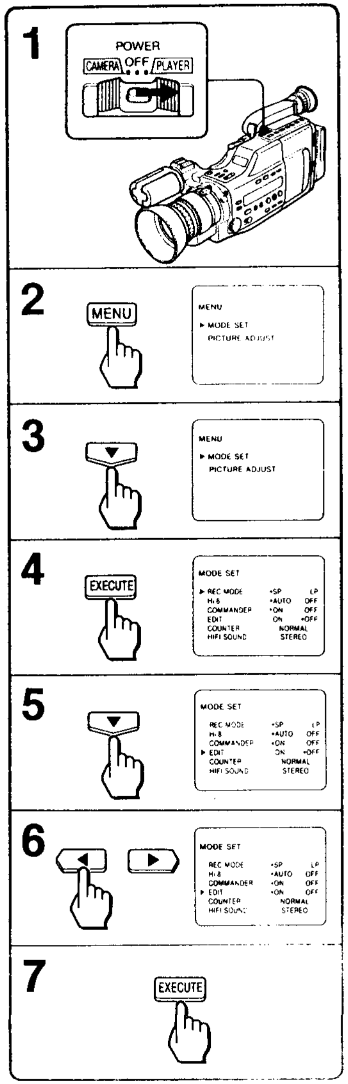
PICTURE ADJUST Menu

(P-2)

SLOW
Press ◀ or ▶ to clear out the noise bands that may appear on the top or bottom of the picture during slow playback. Adjustable only in the slow playback mode.

STILL
Press ◀ or ▶ so that the vertical shaking of the picture during still mode will stop. Adjustable only in the still mode.

(P-3)


1
POWER
CAMERA OFF PLAYER
2
MENU
MENU
▶ MODE SET
PICTURE ADJUST
3
MENU
▶ MODE SET
PICTURE ADJUST
4
EXECUTE
MODE SET
▶ REC MODE •SP LP
Hi-8 •AUTO OFF
COMMANDER •ON OFF
EDIT ON •OFF
COUNTER NORMAL
HiFi SOUND STEREO
5
MODE SET
REC MODE •SP LP
Hi-8 •AUTO OFF
COMMANDER •ON OFF
▶ EDIT ON •OFF
COUNTER NORMAL
HiFi SOUND STEREO
6
MODE SET
REC MODE •SP LP
Hi-8 •AUTO OFF
COMMANDER •ON OFF
▶ EDIT •ON OFF
COUNTER NORMAL
HiFi SOUND STEREO
7
EXECUTE

How to Call Up the Menu Display

Press the DATA SCREEN button to display the menu on the TV screen.
(P-3)
Example: To select EDIT ON.

1. **Set the POWER switch to PLAYER and insert a cassette.**
2. **Press the MENU button.**
   The MENU display appears.
3. **Press ▼ and move cursor to the desired item.**
4. **Press the EXECUTE button.**
   The selected menu appears.
5. **Press ▼ and move cursor to the desired item.**
6. **Press ◀ or ▶ to select the desired setting.**
7. **Press the EXECUTE button.**
   The setting is stored in the camcorder and the menu display is cleared.

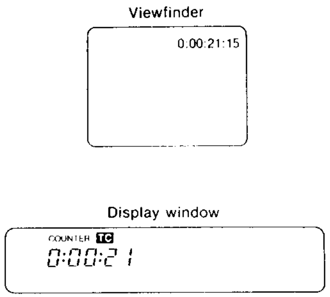
The setting is stored in the memory for about 5 minutes even if the POWER switch is returned to OFF or the power source is removed, as long as the lithium battery is installed.

To display another menu
Start from step 1 in "How to Call Up the Menu Display."

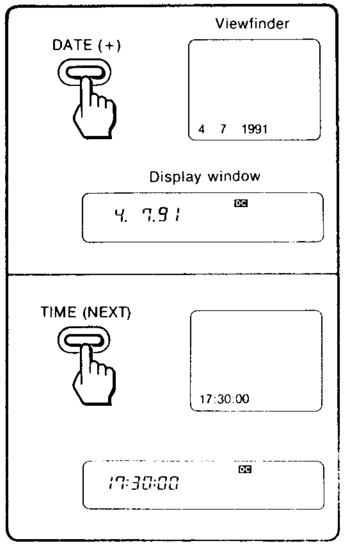
To return to the original screen
Press the MENU button.

To make multiple settings within one menu
After step 6 in "How to Call Up the Menu Display", press ▼ and move cursor to the desired item.

(Q-1)



(Q-2)



Displaying the RC Time Code/Data Code

The RC time code and data code (recording date and time) recorded on a tape can be displayed in the viewfinder and display window during playback. You can easily locate the desired tape programme by observing the RC time code and data code.
You can also edit the RC time code and data code on another tape while they are displayed. (The signals of these codes cannot be edited.)

To Display the RC Time Code

(Q-1)

Set the COUNTER mode to TIME CODE in the menu, referring to "How to Call up the Menu Display" on page 61.
The TC indication appears in the display window and the RC time code is displayed in the viewfinder and display window.
The frame digits are displayed only in the viewfinder.

To display the RC time code on the TV screen
Press the DATA SCREEN button.

To Display the Data Code

(Q-2)

1 **Set the POWER switch to PLAYER.**

2 **Set the COUNTER mode to TIME CODE in the menu, referring to "How to Call up the Menu Display" on page 61.**

3 **Press the DATE button to display the date, or the TIME button to display the time.**
The DC indication appears in the display window with the date or time.

To clear the data code indication
Press the same button again.

To display the data code on the TV screen
- During normal or various mode playback, simply press the DATE or TIME button.
- In stop, fast-forward or rewind mode, first press the DATA SCREEN button and then press the DATE or TIME button.

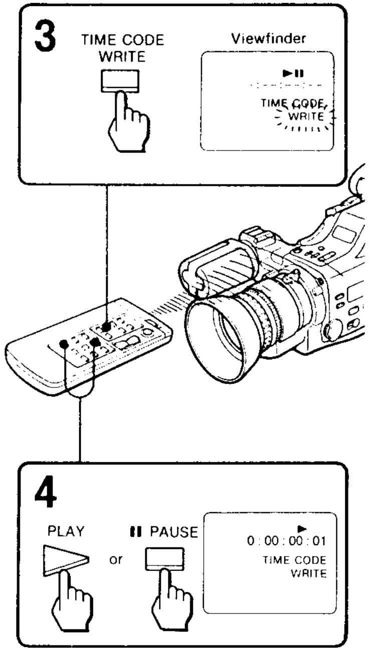
Notes on the data code
- The data code cannot be displayed when the POWER switch is set to CAMERA.
- In the picture search or skip scan mode, streaks may cover the data code on the screen.

When bars (----) appear in place of the RC time code or data code indication
- A blank portion of the tape is played back.
- The data code on the tape is illegible due to tape damage or noise.
- The current date and time are not set.
- The tape is in fast-forward or rewind mode.

When the remote control unit provided with the counter display is connected
The counter indication on the remote control unit can be switched to the RC time code indication by setting the COUNTER mode to TIME CODE on this camcorder. In this case, "F:FF:FF" indication may appear on certain units. This is not a failure of the camcorder or the remote control unit.

Notes on RC time code difference
There may be a difference of several frames between the recorded frame number and the frame number of the actual picture. This is because during playback, the frame number display switches by several frames on the screen.
When playing back the tape in still picture, picture search or slow playback mode, however, the frame number corresponds to the actual picture.

(R)



Writing the RC Time Code on a Prerecorded Tape

You can write the RC time code on a tape without affecting the prerecorded picture and sound.

To Write the RC Time Code from the Beginning of the Tape

(R)

1 Rewind the tape to the beginning.

2 Set the camcorder to the playback pause mode.

3 Press the TIME CODE WRITE button on the Commander.
The TIME CODE WRITE indication appears in the viewfinder with WRITE blinking.

4 Press the ▷ button or the II button to start playback.
The WRITE indication stops blinking and the RC time code writing starts from 0:00:00:00.

To stop the RC time code writing
Press the ☐ button (or another tape transport button).

To Write the RC Time Code from the End of the RC Time Code Prerecorded Portion

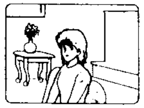
Rewind the tape up to the portion on which the RC time code has been written, and follow steps 2 to 4 of "To Write the RC Time Code from the Beginning of the Tape". The RC time code is written continuously.

Notes on RC time code writing
- If you start RC time code writing from the portion on the tape without a time code, the time code is written from 0:00:00:00 even when the tape is not at its beginning.
- By writing the RC time code, the data code and the index signals recorded on the tape are erased.
- If the RC time code writing is performed on a blank portion of a tape, the time code is written correctly, although the screen is noisy.
- If you intend to write the RC time code from the middle of a tape without a time code, writing starts several frames before the current picture.

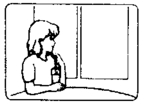
The RC time code writing is canceled when:
- you press the TIME CODE WRITE button again in the playback pause mode.
- you press the INDEX button on the Commander in the playback pause mode.
- you change the playback mode to another mode.

(S-1)

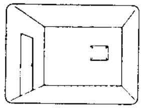
[a]



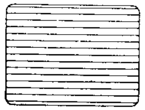
[b]



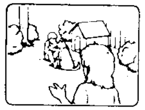
[c]



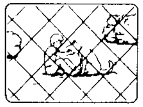
[d]



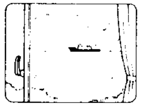
[e]



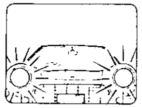
[f]



[g]



[h]



Manual Focusing

When the AUTO LOCK switch is set to AUTO LOCK, the auto-focusing functions to easily get an in-focused picture under most shooting conditions. But manual focusing is recommended under the following cases:

[a] to **[h]** correspond to the illustrations. **(S-1)**

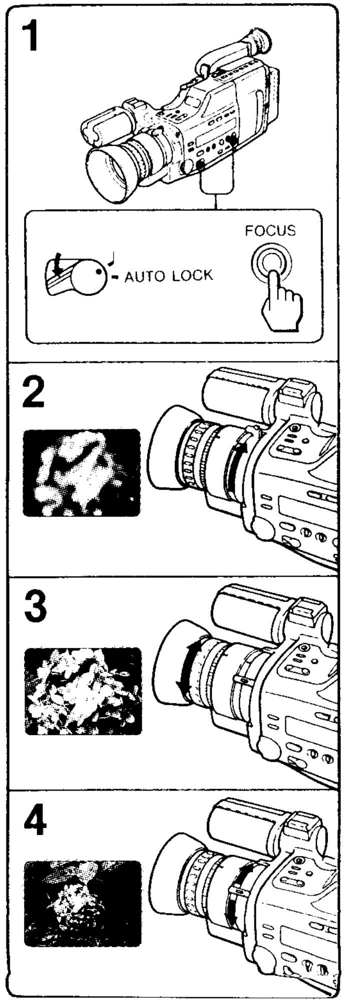
[a] Insufficient light
[b] Strong illumination from behind the object
[c] Objects with little contrast such as a wall, sky, etc.
[d] Finely detailed repetitive patterns, horizontal stripes, diagonal subject
[e] One object is close and the other is at a distance but is in the center
[f] Objects beyond nets, or another object passes just in front of the camcorder
[g] Object beyond frosted glass
[h] Bright object or object reflecting light
[i] Under special shooting conditions:
- When using conversion lenses or effect filters
- When shooting close-ups (Macro)
- When shooting a stationary objects using a tripod
- To prevent battery wear

Note on automatic focusing
While recording with the auto focusing function, do not touch the focus ring forcibly.

When the auto focusing does not function momentarily
- Shutter speed setting is changed.
- Programmed AE mode is changed.
- Aperture value is changed.
- Gain setting is changed.
- Lighting conditions change quickly.
- Zooming from wide to telephoto.
- The camcorder is rapidly panned from a distant subject to a nearby subject with less contrast.
- Shooting fast moving objects.

Some helpful hints
- When shooting relatively dark places, such as indoors, the depth of field in proper focus is very shallow.
- When shooting with auto focusing with the zoom lever set to the wide angle position, the focus ring will be fixed around the 2 m position and may not exactly match the actual object-to-camera distance.
- The figures on the focus ring indicate the distance between the object and the Φ mark on the camcorder.

(S-2)



Focusing Manually

(S-2)

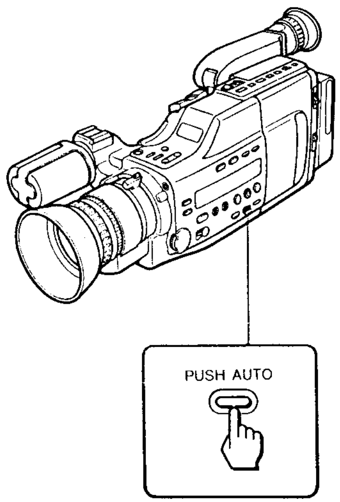
1 **Set the AUTO LOCK switch down and press the FOCUS button.**
Check that the auto focus frame is cleared from the viewfinder.

2 **Turn the manual zoom lever fully to the telephoto position.**

3 **Turn the focus ring to achieve sharp focus.**

4 **Move the zoom lever to set to the desired shot length.**

(S-3)



Shooting with Auto Focusing Momentarily

(S-3)

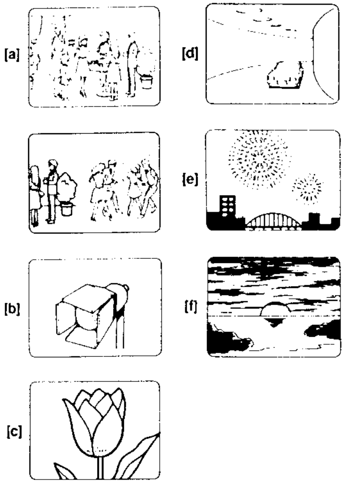
While shooting with manual focusing, press the PUSH AUTO button.
The auto focus functions while you are pressing the PUSH AUTO button.

When the button is released, manual focusing will resume. Use this button when focusing on one object to the other for natural focusing. Shutter speed, white balance, gain, aperture, and/or programmed AE modes will be retained to the previous setting.

When the camcorder focuses on the background during auto focusing
To focus on the subject on the foreground, first shoot the subject on the foreground or set the focus ring to 1.3 m manually. Then set the AUTO LOCK switch to AUTO LOCK or press the PUSH AUTO button.

When the camcorder focuses on the foreground during auto focusing
To focus on the background, first shoot the distant view or set the focus ring to ∞ manually. Then set the AUTO LOCK switch to AUTO LOCK or press the PUSH AUTO button.

(T-1)



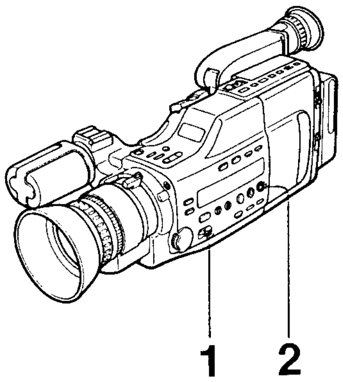
Adjusting the White Balance

In order to record the colour of the object as it is, the common method is to adjust the camcorder to record the white colour as white in various shooting conditions. This is accomplished by adjusting the white balance. When the AUTO LOCK switch is set to AUTO LOCK, the auto white balance functions adjust the white balance under most shooting conditions. But to record the colour of the subject more precisely, without being affected by the colour temperature of the ambient light, adjust the white balance manually.

[a] to [f] correspond to the illustrations. **(T-1)**

	Conditions	Indication in the viewfinder
[a]	Lighting conditions change quickly	☼
[b]	Too bright, such as in photograph studios	
[c]	Monochromatic subject or background	■
[d]	Under a sodium lamp	☼
	Under a mercury lamp	
	Under a colour matching fluorescent lamp	☀
[e]	Recording outdoors: a night view, neon signs, or fireworks	
[f]	Recording outdoors: scenes after sunset or before sunrise	

(T-2)



Adjusting the White Balance Manually

(T-2)

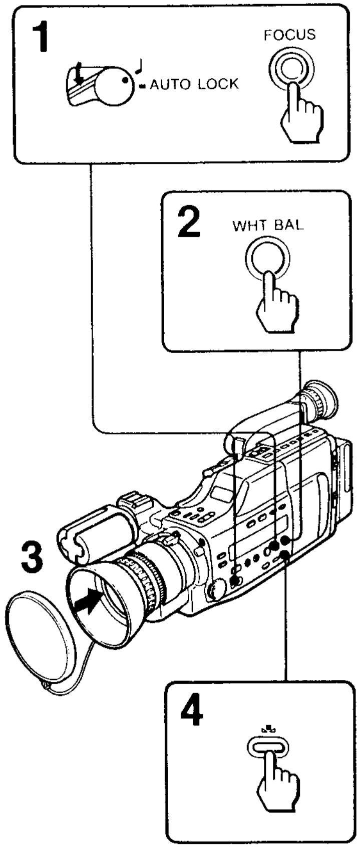
1 **Set the AUTO LOCK switch down.**

2 **Set to the appropriate white balance mode by pressing the WHT BAL button.**
The indication changes in the order below each time the button is pressed.

No indication → ■ → ☀ → ☼
(auto)

Note on manual white balance adjustment
Each time the shooting conditions change, for example when moving from indoors to outdoors or vice versa, the white balance should be reset to the new lighting condition. First, set the AUTO LOCK switch to AUTO LOCK. Then set it down again for manual white balance adjustment.

(T-3)



Adjusting the White Balance Precisely

(T-3)

The one-push white balance function adjusts the white balance at the press of the button and maintains that condition. When the lighting condition changed or when recording subjects with different colour temperature, use the one push white balance function to achieve recording with natural colours without being affected by the ambient light.

1 **Set the AUTO LOCK switch down and press the FOCUS button.**
The camcorder enters the manual focus mode.

2 **Press the WHT BAL button to call up the ◺■◿ indication.**
The ◺■◿ indication is blinking slowly.

3 **Attach the white lens cap to the camcorder and point it to a subject (outdoors) or to the light source (indoors).**

4 **Press the ◺■◿ button in the recording standby mode.**
The ◺■◿ indication will blink rapidly.

5 **The ◺■◿ indication stops blinking to indicate that the new white balance is stored in the memory.**
The memory is retained for approximately 1 hour even if the POWER switch is set to OFF or if the battery pack is removed.

When recording under fluorescent light

- Press the WHT BAL button to clear the white balance indication and return to automatic white balance adjustment.
- Use the one push white balance function.
- Set the AUTO LOCK switch to AUTO LOCK.

(T-4)

Colour temperature (K)		Light source
↑	10,000	Clear sky
	8,000	
Blue		Slightly overcast
	7,000	Cloudy, rainy
	6,000	Fluorescent lamp (daylight)
	5,000	
White		Direct sunlight
		Fluorescent lamp (daylight)
	4,000	1 hr. after/before sunrise/sunset
	3,500	↑ Fluorescent lamp (off-white)
		Studio lamp
		Halogen lamp
	3,200	
	3,000	
Yellow		Tungsten lamp
	2,500	30 min. after/before sunrise/sunset
Red		↓
	2,000	Sunrise/sunset
↓		Candlelight

White Balance and Colour Temperature

(T-4)

The colour temperature indicates the relative reddishness or bluishness of light measured in Kelvin degrees (K). It increases as the light source gets bluish and decreases as the light source gets redder. If has no direct relation with brightness of the light. The camcorder automatically adjusts the white balance within the range shown in the diagram on the left.

What the ◺■◿ indication means

- Slow blinking: white balance not adjusted
- Fast blinking: white balance being adjusted by the ◺■◿ button.
- Stops blinking: white balance adjusted

When the ◺■◿ indication does not stop blinking

The white balance cannot be adjusted and the ◺■◿ indication does not stop blinking.

- When shooting in a dark place
- When the camcorder was pointed to an object that was not white.
- When white balance adjustment was attempted without the white lens cap.

In these cases, point the camcorder to a bright light source or point the camcorder to a white object.

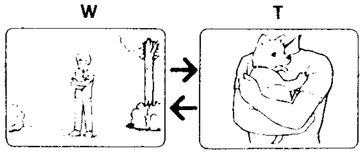
If the ◺■◿ indication still does not stop blinking

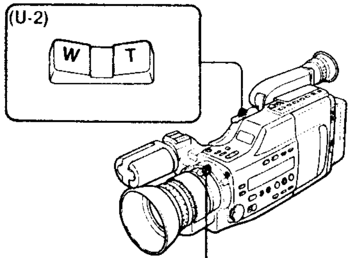
- Press the WHT BAL button to clear the white balance indication and return to automatic white balance adjustment.
- Set the AUTO LOCK switch to AUTO LOCK.

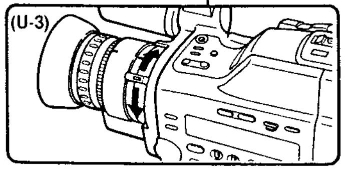
When the lighting condition changed

- Readjust the white balance by the ◺■◿ button during the recording standby mode. The ◺■◿ button does not function during recording.
- The white balance adjustment is effected by the setting of the aperture and shutter speed. When the aperture or shutter speed is adjusted manually, and the camcorder was moved from indoors to outdoors or vice versa, the white balance setting may not be correct. In this case, set the AUTO LOCK switch to AUTO LOCK again and readjust the white balance automatically.

(U-1)







Zooming

(U-1)

The size of the subject in the screen can be changed. Use "zoom-in" for dramatic close-ups and "zoom-out" for panoramic long shots. Also, use zooming during manual focusing. The camcorder's zoom button offers a variable speed zooming; pressing it firmly for high speed zooming and softly for relatively slow zooming.

Power Zooming — for Smooth and Constant Zooming

(U-2)

Press the T side of the power zoom button for telephoto.
This gives a close up shot of an object far from the lens.

Press the W side of the power zoom button for wide.
This gives a broad view of the scene.

Manual Zooming — to Create a Dramatic Effect

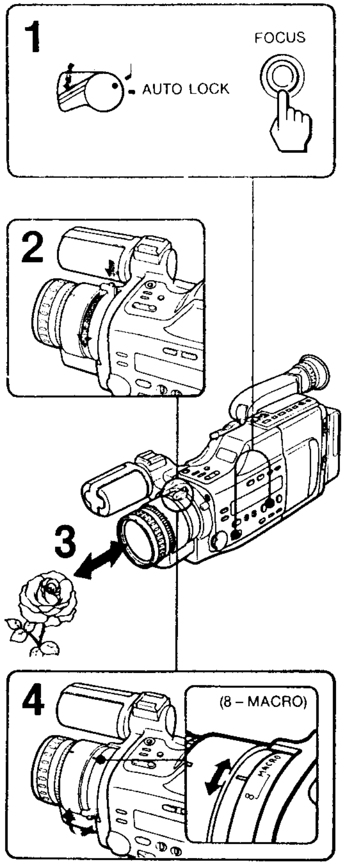
(U-3)

Turn the manual zoom lever upward for telephoto and downward for wide.

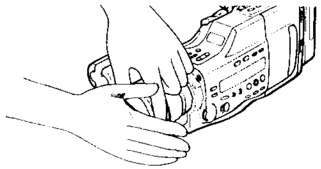
Focal length of this camcorder
The focal length is 8 mm to 80 mm. This is approximately 43 mm to 430 mm converted to the focal length of a 35 mm camera.

Using the zoom button on the Commander
Variable speed zoom cannot be operated with the zoom button on the Commander.

(V-1)



(V-2)



Close-ups (Macro)

Tiny objects such as flowers, insects, and images in photographs, can literally fill the screen using the close-up function. It is also useful when recording a title.

(V-1)

1 **Set the AUTO LOCK switch down and press the FOCUS button.**
Check that the auto focus frame is cleared from the viewfinder.

2 **Turn the zoom lever down, while pressing the green macro set button, as far as it will go into the MACRO range.**

3 **Bring the camcorder as close as necessary to the subject to obtain the desired subject size.**
The subject can be as close to the lens surface at approximately 10 mm.

4 **Turn the zoom lever within the MACRO range to focus sharply.**

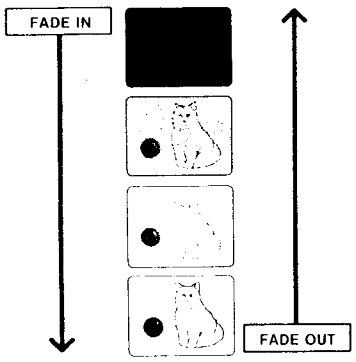
Notes
- Auto focusing does not function in macro shooting.
- If the object is closer than 10 mm, it may not be brought in focus.

If the lens hood touches the object (V-2)
Remove the lens hood. Hold the focus ring and turn the hood by pressing it with your palm. Do the same when attaching or removing the filter or conversion lens (not supplied).

Recommended accessory
When shooting in macro, the depth of field is very shallow. Pay attention to focusing. To keep the object in focus, use a tripod.

Fade-in and Fade-out

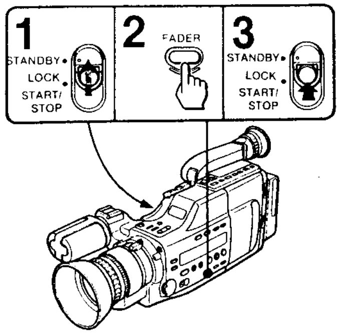
(W-1) (W-2)



When fading-in, the picture will gradually appear from a black screen. The sound will gradually increase in accordance with the picture. **(W-1)**
When fading-out, the picture will gradually disappear into a black screen. The sound will gradually decrease in accordance with the picture. **(W-2)**
Use this function to give a professional effect to your recording.

To Fade-in

(W-3)



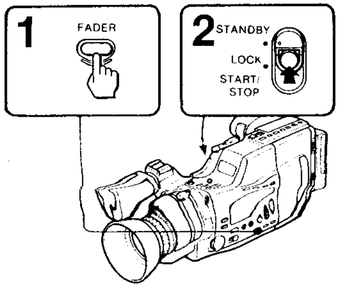
1 **Slide the STANDBY switch up.**
The camcorder enters the recording standby mode.

2 **Press the FADER button.**

3 **Press the START/STOP button.**
Fade-in is performed and recording starts.

To Fade-out

(W-4)



1 **Press the FADER button while recording.**

2 **Press the START/STOP button to stop recording.**
Fade-out is performed and then recording stops.

When the FADER function works
The FADER function works only when the camcorder is in the recording standby mode or recording mode.
It does not function in the stop mode.

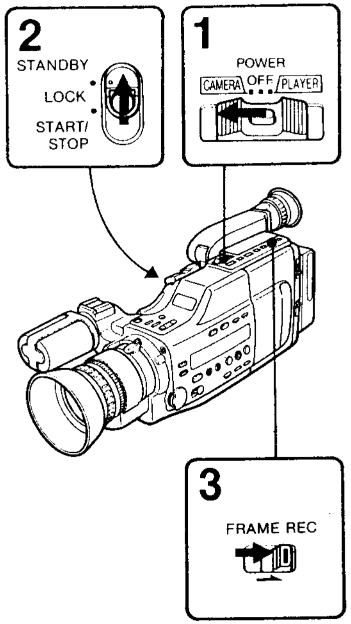
To cancel the fade-in/fade-out function before it is preformed
Press FADER before pressing START/STOP.

To use the fade-in/fade-out function repeatedly
Start from step 1 each time.

When the title, date or time is displayed
The title, date or time does not fade-in or fade-out.

Frame Recording

(X)



(X)
A recording of approximately 4 frames can be performed with this camcorder. With this function, an animated effect can be recorded by repeating frame recording after moving the subject little by little. Fix the camcorder at one point for effective frame recording.

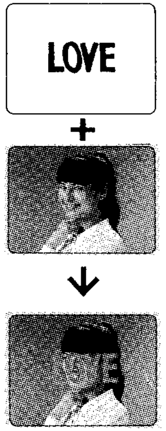
1 **Set the POWER switch to CAMERA.**

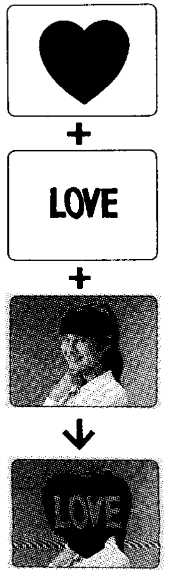
2 **Slide the STANDBY switch up.**
The camcorder enters the recording standby mode.

3 **Slide the FRAME REC button.**
Recording of approximately 4 frames is performed. After frame recording is completed, the camcorder will enter the recording standby mode with STBY indication in the viewfinder.

4 **Move the subject and repeat step 3.**

(Y-1)





Recording a Title

(Y-1)

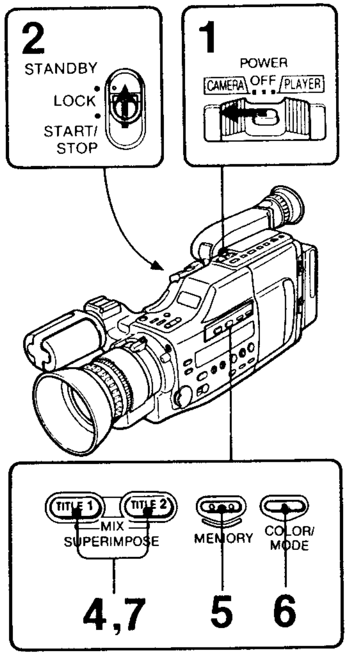
Original hand-lettered message or illustration can be superimposed over the picture. Two titles can be stored and 8 different colours can be used for the titles.

This function can be used during the following situations.

(1) During camera recording.
(2) During playback.
(3) During camera recording, superimpose a title.
Then superimpose another title during playback.
(4) During editing, use the camcorder as a playback VTR. Titles can be superimposed over the playback picture (with or without a title superimposed) and then recorded together onto the recording VTR.

Before recording or playback, store the desired title in the camcorder.

(Y-2)



Storing a Title

(Y-2)

Before storing

- Prepare title cards.
  Use a plain, white card and draw titles in dark colour and with thick lines. Street signs and printed materials with high contrast can be used as a title.
- Install the lithium battery (page 27).
  The titles cannot be kept in the memory unless the lithium battery is installed.

Operation

1 **Hold down the green button and slide the POWER switch to CAMERA.**

2 **Slide the STANDBY switch up.**
The camcorder enters the recording standby mode.

3 **Point the camcorder to the title card and adjust the focus.**
To focus on the title, use the macro function. (page 75).

4 **Press the TITLE 1 or TITLE 2 button.**

5 **Press the MEMORY button.**
The title is stored to the button pressed in step 4.

6 **Press the COLOR/MODE button to select the colour of the title.**
Each time you press the button, the indication in the viewfinder changes as follows.

WHT (white) → BLUE → GRN (green) → CYAN ↓
↑
BLK (black) ← YEL (yellow) ← VIO (violet) ← RED

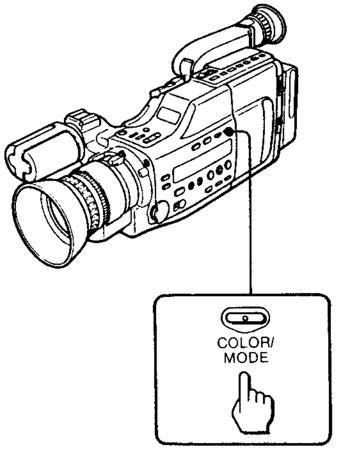
7 **Press the TITLE 1 or TITLE 2 button, whichever was pressed in step 4, to clear the title from the viewfinder.**
The title is stored to that button until you store another one over it.

To check the title
Press the TITLE 1 or TITLE 2 button, whichever was pressed in step 4, in the standby mode. To clear the title from the viewfinder, press the same button again.

To store a new title
Repeat steps 1 to 7. A new title is stored to the TITLE 1 or TITLE 2 button and the previous title will be deleted from that button.

When storing a title in the memory
When a cassette is installed, the camcorder will return to the power off mode after 5 minutes. Take out the cassette if more than 5 minutes will be needed to store the title.

(Y-3)



Function of the COLOR/MODE Button

(Y-3)

The COLOR/MODE button works in two ways. When a title is displayed in the viewfinder, the colour of the title can be changed. When the title is not displayed, the title display mode can be changed.

To select the colour

1 **Press the TITLE 1 or TITLE 2 button to display the title.**

2 **Press COLOR/MODE.**
Each time the button is pressed, the colour indication changes as follows.

WHT (white) → BLUE → GRN (green) → CYAN ┐
↑ ↓
BLK (black) ← YEL (yellow) ← VIO (violet) ← RED

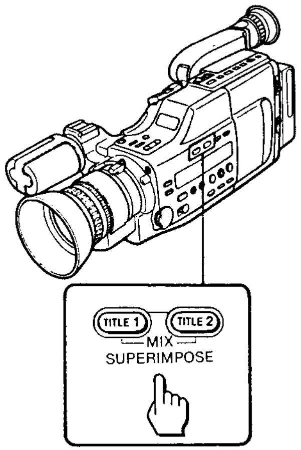
To select the display mode

1 **If the title is displayed, press the TITLE 1 or TITLE 2 button to clear the title.**

2 **Press COLOR/MODE.**
Each time the button is pressed, the mode indication in the viewfinder changes as follows.

↑: Scroll up the title.
↓: Scroll down the title.
🅃: Reverse the title.
🅃↑: Reverse the title and scroll it up.
🅃↓: Reverse the title and scroll it down.

(Y-4)



Superimposing One Title

(Y-4)

1 During playback or recording, press the TITLE 1 or TITLE 2 button at the point from which you want to use the title.
The title is displayed. During recording the title will be recorded onto the tape. During playback the title will not be recorded on the tape.

2 Press the same button pressed in step 1 at the point you wish to clear the title.

When recording the title at the beginning
We recommend the following method:

1 Set the camcorder in the standby mode.

2 Display the title referring to step 1 above.

3 Release the standby mode.

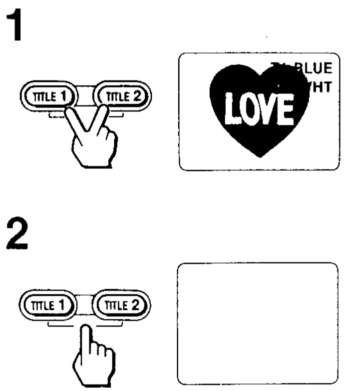
4 Clear the title referring to step 2 above.

When recording a title onto the playback picture
The title can be superimposed on the playback picture but cannot be recorded with this camcorder alone. Make connections for editing and record the picture with title superimposed on another VTR. (See page 117.)

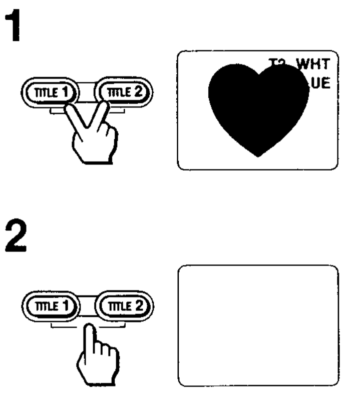
About the colour indication
- The colour indication in the viewfinder is not recorded.
- Even after the title is displayed, the colour can be changed by pressing the COLOR/MODE button.

When displaying the title in the playback mode
The title is cleared if you press ◀◀ or ▶▶, and appears again when normal playback resumes.

(Y-5)



(Y-6)



Layering One Title over the Other

The title stored in the TITLE 1 button and the TITLE 2 button can be displayed at the same time with one title layered on the other.

Example: When a blue heart is stored in the TITLE 1 button and a white title "LOVE" is stored in the TITLE 2 button.

To display TITLE 1 in the background and TITLE 2 in the foreground
(Y-5)

1 During playback or recording, hold down the TITLE 1 button and press the TITLE 2 button.

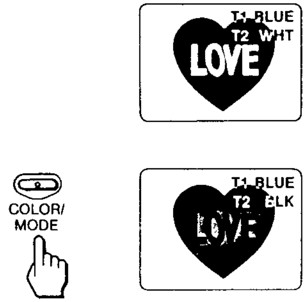
2 Press the TITLE 1 or TITLE 2 button at the point you wish to clear the title.

To display TITLE 2 in the background and TITLE 1 in the foreground
(Y-6)

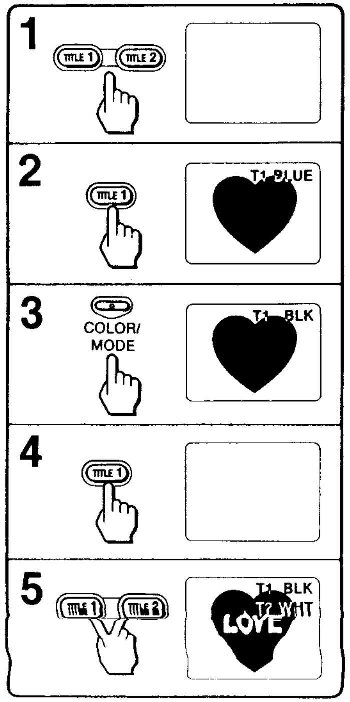
1 During playback or recording, hold down the TITLE 2 button and press the TITLE 1 button.
In this case, TITLE 2 "LOVE" is hidden behind TITLE 1 and is not shown. Before using this function, check whether the title stored in the memory is appropriate for this application.

2 Press the TITLE 1 or TITLE 2 button at the point you wish to clear the title.

(Y-7)


T1 BLUE
T2 WHT
LOVE
COLOR/
MODE
T1 BLUE
T2 BLK

(Y-8)


1
TITLE 1
TITLE 2
2
TITLE 1
T1 BLUE
3
COLOR/
MODE
T1 BLK
4
TITLE 1
5
TITLE 1
TITLE 2
T1 BLK
T2 WHT
LOVE

To Change the Colour of the Title after Layering One Title over the Other

Example: When a blue heart is stored in the TITLE 1 button and a white title "LOVE" is stored in the TITLE 2 button.

To change the colour of the title in the foreground
(Y-7)

Press the COLOR/MODE button.
Each press of COLOR/MODE will change the colour of "LOVE".

To change the colour of the title in the background
(Y-8)

1 **Press the TITLE 1 or TITLE 2 button to clear the title.**

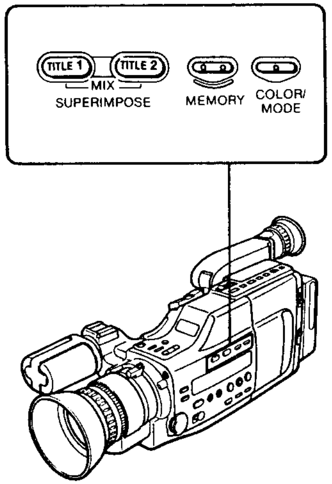
2 **Press the TITLE 1 button.**
TITLE 1, blue heart, is displayed.

3 **Press the COLOR/MODE button to change the colour of TITLE 1.**
The colour of TITLE 1, blue heart, changes.

4 **Press the TITLE 1 button.**
TITLE 1, black heart, is cleared from the picture frame.

5 **Hold down the TITLE 1 button and press the TITLE 2 button.**

(Y-9)


TITLE 1
TITLE 2
MIX
SUPERIMPOSE
MEMORY
COLOR/
MODE

Various Title Display Modes

Follow the steps below to enjoy the various title display modes.

(Y-9)

Step 1
During camera recording or playback, press the COLOR/MODE button to select the title display modes. Refer to the following page for the available modes.

Step 2
Call up the title.

To display one title:
Press the TITLE 1 or TITLE 2 button.
To layer one title over the other:
Call up the title referring to page 83.

Step 3
Clear the title.

When one title is displayed:
Press the same button pressed in step 2.
When one title is layered over the other:
Press either the TITLE 1 or TITLE 2 button.

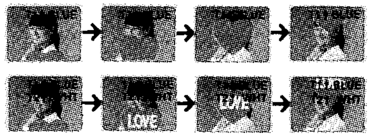
Title display modes

Each time you press the COLOR/MODE button, the title display modes change in the following order.

(Y-10)

- **Normal title display (Y-10)**

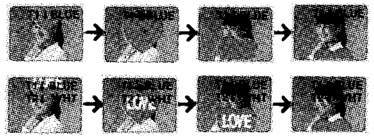
(Y-11)



- **Scrolling up the title (Y-11)**

Step 1: The ↑ indication is displayed.
Step 2: The title is scrolled upwards to the center and stops.
Step 3: The title is scrolled up and out of the picture frame.

(Y-12)



- **Scrolling down the title (Y-12)**

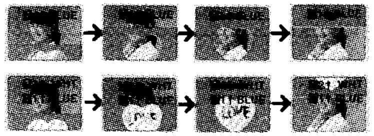
Step 1: The ↓ indication is displayed.
Step 2: The title is scrolled downwards to the center and stops.
Step 3: The title is scrolled down and out of the picture frame.

(Y-13)

- **Reversing the title with the picture (Y-13)**

Step 1: The 🆃 indication is displayed.
Step 2: The reversed title is displayed.
Step 3: The title is cleared from the picture frame.

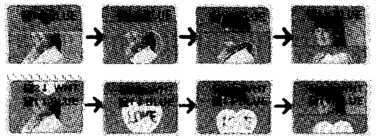
(Y-14)



- **Scrolling up the reversed title (Y-14)**

Step 1: The 🆃↑ indication is displayed.
Step 2: The reversed title is scrolled upwards to the center.
Step 3: The reversed title is scrolled up and out of the picture frame.

(Y-15)



- **Scrolling down the reversed title (Y-15)**

Step 1: The 🆃↓ indication is displayed
Step 2: The reversed title is scrolled downwards to the center.
Step 3: The reversed title is scrolled down and out of the picture frame.

To scroll up or down through the picture frame

Press the TITLE 1 or TITLE 2 button twice successively. The title does not stop on the center, but is scrolled up or down and out of the picture frame.

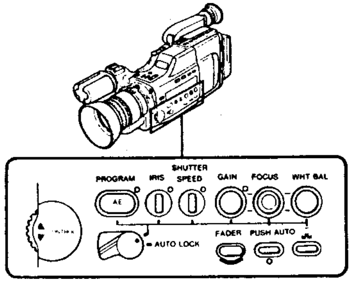
When displaying one title over the other

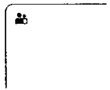
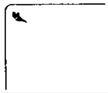
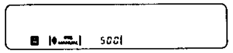
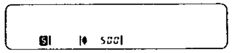
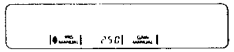
- TITLE 1 and TITLE 2 cannot be called up in the different title display mode at the same time. For example, calling up TITLE 1 in the reverse mode and TITLE 2 in the scroll up mode at the same time is not possible.
- When scrolling the two titles layered, press the second title button before the first title starts to scroll.

Notes on scrolling

- You can scroll the title only when the camcorder is in the recording standby, recording, or normal playback mode. Only normal title display mode (no indication) and reverse title display mode (🆃) can be performed during modes other than the three above. (Refer to "Various Playback Modes" on page 48.)
- If you select the scroll mode first, and then set the camcorder to the still picture, slow playback, or double speed playback, the scroll mode will be canceled automatically.

(Z-1)



Viewfinder	Display window
(Z-2) 	
(Z-3) Example 	
(Z-4) Example AE A 500 ▶ F8	Example 
(Z-5) Example AE S ▶ 500 F8	Example 
(Z-6) Example 250 ▶ F4 0 dB	Example 

Recording a Picture Using Programmed AE and Manual Modes

(Z-1)

A variety of camera recording modes can be selected for this camcorder, from the full automatic mode to the programmed AE mode in which camera recording modes most suited for the subject and/or the condition is adjusted automatically. In addition, the manual mode enables independent setting of the aperture value, shutter speeds, and gain. Setting of a single parameter or a combination of two or three parameters at one time is possible.

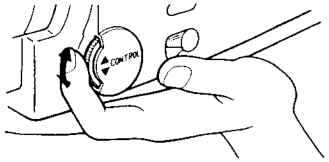
Camera Recording Modes Available

With the AUTO LOCK switch set down, each press of the PROGRAM AE button changes the camera recording mode as follows.

→ Portrait (Z-2)
↓
Sports (Z-3)
↓
Aperture priority (Z-4)
↓
Shutter priority (Z-5)
↓
Manual (Z-6)
The selected parameters are displayed

During programmed AE and manual modes
Focus and white balance can be adjusted independently from the programmed AE mode or the manual mode. Manual adjustment of focus and white balance is recommended.

(Z-7)

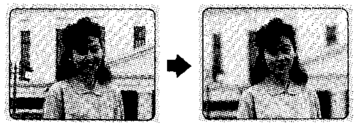


How to use the CONTROL dial (Z-7)
Move the dial slowly using the tip of your index finger. If the dial is released immediately after holding it to the maximum position, the sound of the dial returning to the normal position may be recorded.

When recording in the aperture priority mode or the manual mode
Do not point the lens at the sun or other light sources when the aperture value is set to F1.8.

Portrait Mode

(a-1)



(a-1)

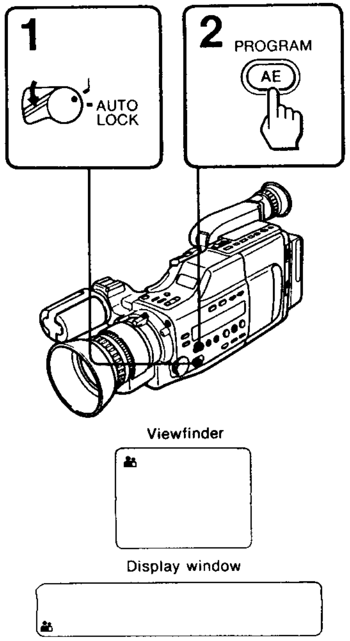
In the portrait mode, the subject is in focus and the background is out of focus. The aperture (opening of the iris) and the shutter speed is automatically adjusted to maintain the appropriate exposure according to the size and brightness of the subject. The portrait mode is most effective when used outdoors.

Portrait Mode Applications

- To shoot a subject with not much movement, such as a portrait of a person or a close up of a flower.
- To zoom in a subject with the telephoto mode.
- To shoot a subject with an obstruction in the foreground.

Operation

(a-2)



(a-2)

1 **Set the AUTO LOCK switch down.**

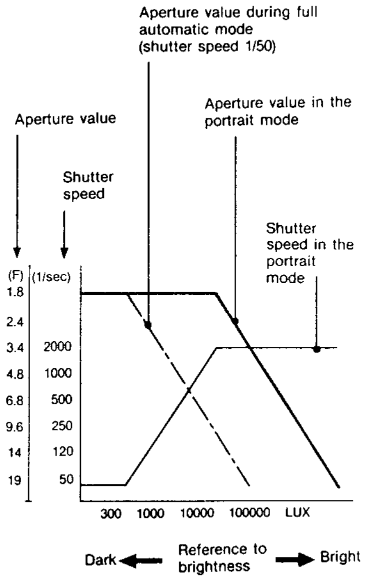
2 **Press the PROGRAM AE button until the 👥 indication is displayed in the viewfinder and the display window.**
The camcorder enters the portrait mode.

To return to the full automatic mode
Set the AUTO LOCK switch to AUTO LOCK.

To enter other programmed AE modes from the portrait mode
Press the PROGRAM AE button to display the desired programmed AE mode.

When recording in the portrait mode
Focus and white balance can be adjusted manually. See page 68 (focus) and page 71 (white balance) for details.

(a-3)



Hint for effective camera work
Use of the portrait mode with the following method will gradually make the background out of focus while keeping the subject in focus.

1 **Enter the portrait mode referring to page 90.**

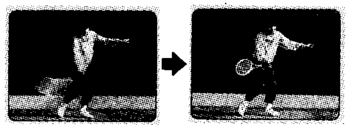
2 **Set the AUTO LOCK switch to AUTO LOCK and start recording.**

3 **Set the AUTO LOCK switch down.**
The camcorder will enter the portrait mode and make the background out of focus.

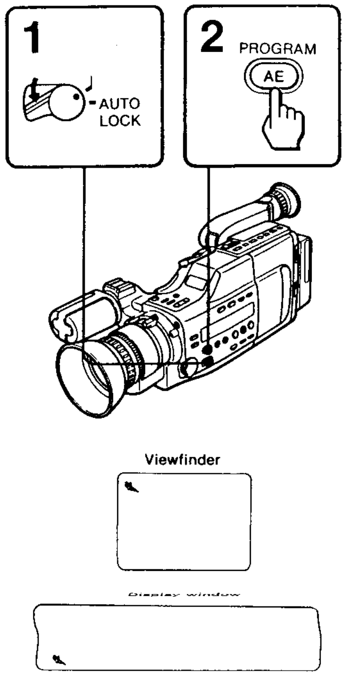
The theory of the portrait mode
(a-3)
When shooting outdoors under bright sunlight in the full automatic mode, the aperture tends to close and both the subject and the background come into focus (deep depth of field). This is a result of excessive light. In order to bring the subject in focus and keep the background out of focus (shallow depth of field), the aperture should be opened. In the portrait mode, the aperture is controlled to open by automatically selecting the shutter speed (between 1/50 and 1/2000 that matches the shooting situation) to maintain the appropriate exposure.

When recording under fluorescent, sodium, or mercury lamps
- The brightness of the recorded picture may flicker.
- The colour of the recorded picture may vary.

(b-1)



(b-2)



Sports Mode

(b-1)

By recording in the sports mode, a subject moving at high speed can be recorded and the picture can be observed more clearly with less picture shaking in the still or slow mode compared to the full automatic mode. The shutter speed and the aperture are automatically adjusted to maintain the appropriate exposure according to the speed of the subject.

Sports Mode Applications

- To shoot outdoor sports scenes, such as football, tennis, and golf.
- To shoot the scenery from inside a moving automobile.

Operation

(b-2)

1 **Set the AUTO LOCK switch down.**

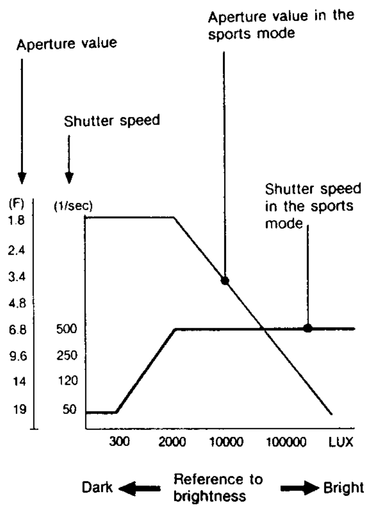
2 **Press the PROGRAM AE button until the indication is displayed in the viewfinder and the display window.**
The camcorder enters the sports mode.

To return to the full automatic mode
Set the AUTO LOCK switch to AUTO LOCK.

To enter other programmed AE modes from the sports mode
Press the PROGRAM AE button to display the desired programmed AE mode.

When recording in the sports mode
Focus and white balance can be adjusted manually. See page 68 (focus) and page 71 (white balance) for details.

(b-3)



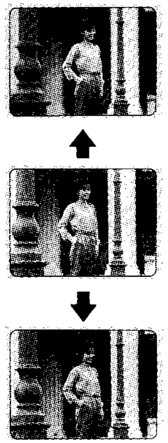
Hint for effective camera work
When shooting athletic matches from a distance, such as a football game, we tend to zoom from the wide to the telephoto position to catch the once-only events. Even under these circumstances, by using the sports mode, a sharp picture without camera wobble can be obtained when played back later in the slow or still mode.

The theory of the sports mode
(b-3)
When the shutter speed is shifted to a faster speed, subjects moving at high speed, such as a tennis racket or golf club, can be recorded and then played back clearly with less picture shaking compared to the full automatic mode. With this camcorder, the shutter speed can also be set independently from the aperture. However, the picture may become dark when the lighting condition is insufficient. In the sports mode, the fastest shutter speed that matches the shooting situation (between 1/50 and 1/500) is selected to maintain the appropriate exposure.

Note
- The sports mode is effective under sufficient lighting, such as under sunlight. When used under extremely dark conditions, the shutter speed may not be set to high speeds.

When recording under fluorescent, sodium, or mercury lamps
- The brightness of the recorded picture may flicker.
- The colour of the recorded picture may vary.

(c-1)



Aperture Priority Mode

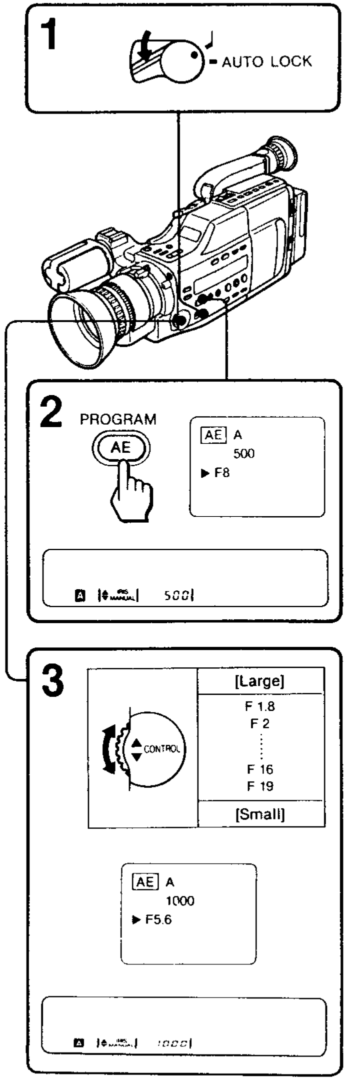
(c-1)

The aperture priority mode enables to select the aperture which determines the depth of field. 15 aperture values, from F1.8 to F19, can be selected. The shutter speed is automatically set (between 1/50 and 1/2000) in combination with the aperture value to maintain the appropriate exposure.

Aperture Priority Application

To shoot the picture with different depths of field.

(c-2)



Operation

(c-2)

1 **Set the AUTO LOCK switch down.**

2 **Press the PROGRAM AE button until the AE A indication is displayed in the viewfinder and A in the display window.**
The camcorder enters the aperture priority mode.

3 **Move the CONTROL dial to set to the desired aperture value.**
The selectable aperture values are:
F1.8, F2, F2.4, F2.8, F3.4, F4, F4.8, F5.6, F6.8, F8, F9.6, F11, F14, F16, F19

The shutter speed indication corresponds to the change of the aperture value.

To return to the full automatic mode
Set the AUTO LOCK switch to AUTO LOCK.

To enter other programmed AE modes from the aperture priority mode
Press the PROGRAM AE button to display the desired programmed AE mode.

When recording in the aperture priority mode
Focus and white balance can be adjusted manually.
See page 68 (focus) and page 71 (white balance) for details.

Hints for effective camera work

- **Understanding the depth of field**

The depth of field is the area in which the objects are in focus. A shallow depth of field shows the subject in focus and the background out of focus. The greatest depth of field shows everything in focus.

- **Depth of field and aperture value**

A large aperture provides a shallow depth of field and a small aperture provides a deep depth of field.

- **Depth of field and object-to-camera distance**

When the object-to-camera distance is near, the depth of field will be shallow. When the object-to-camera distance is far, the depth of field will be great.

- **Depth of field and zooming**

The depth of field will be shallow in the telephoto position. The depth of field will be great in the wide position.

- **Summary**

	A shallow depth-of-field	A deep depth-of-field
Aperture	Towards open	Towards closed
Object-to-camera distance	Near	Far
Zoom	Telephoto	Wide

When the ▶ indication in the viewfinder is blinking

The lighting condition is insufficient or excessive for the aperture priority mode. In this case, move the CONTROL dial and readjust the aperture.

- **Insufficient light (when the picture inside the viewfinder is dark)**
  Decrease the aperture.
- **Excessive light (when the picture inside the viewfinder is too bright)**
  Increase the aperture.

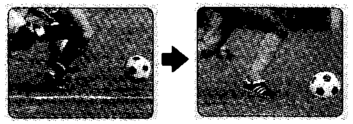
Although we recommend camera recording without the ▶ indication blinking, camera recording can be performed even when the ▶ indication is blinking. Check the picture in the viewfinder before recording.

When recording under fluorescent, sodium, or mercury lamps

- The brightness of the recorded picture may flicker.
- The colour of the recorded picture may vary.

Shutter Priority Mode

(d-1)



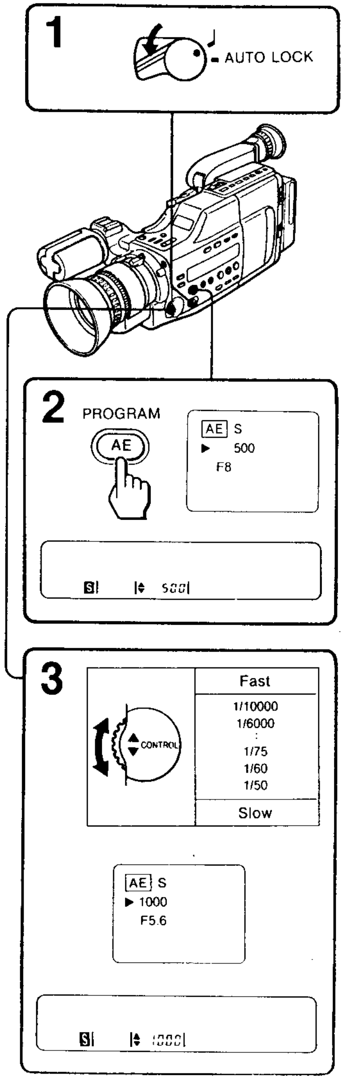
(d-1)

The shutter priority mode enables selection of the shutter speed. 28 shutter speeds can be selected from 1/50 (normal speed) to 1/10000. When a fast shutter speed is selected, subjects moving at high speed can be recorded and the picture can be observed more clearly with less picture shaking in the still or slow modes compared to slower shutter speeds. The aperture value is automatically set (between F1.8 and F19) in combination with the shutter speed to maintain the appropriate exposure.

Shutter Priority Applications

- To shoot a golf swing or a tennis match with the tennis ball captured clearly.
- When you wish to play back certain scenes with high speed movements in a clear, sharp picture.

(d-2)



Operation

(d-2)

1 **Set the AUTO LOCK switch down.**

2 **Press the PROGRAM AE button until the AE S indication is displayed in the viewfinder and S in the display window.**
The camcorder enters the shutter priority mode.

3 **Move the CONTROL dial to set to the desired shutter speed.**
The selectable shutter speeds are:
1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/215, 1/250, 1/300, 1/350, 1/425, 1/500, 1/600, 1/725, 1/850, 1/1000, 1/1250, 1/1500, 1/1750, 1/2000, 1/2500, 1/3000, 1/3500, 1/4000, 1/6000, 1/10000

The aperture value indication corresponds to the change of the shutter speed.

To return to the full automatic mode
Set the AUTO LOCK switch to AUTO LOCK.

To enter other programmed AE modes from the shutter priority mode
Press the PROGRAM AE button to display the desired programmed AE mode.

When recording in the shutter priority mode
Focus and white balance can be adjusted manually. See page 68 (focus) and page 71 (white balance) for details.

Hints for effective camera work
Refer to the chart below for the appropriate shutter speed for the object. Check the brightness of the picture in the viewfinder.

When to use	Recommended speed
• On clear days, recording golf or tennis scenes. (To view the hit ball clearly in the slow or still mode, select shutter speeds between 1/1000 and 1/4000) • Recording the skiers.	1/10000 to 1/600
• On overcast days, recording a moving merry-go-round or a roller coaster. • Recording outdoors stably from inside a moving automobile. • General athletic scenes, marathon, etc.	1/500 to 1/150
• Used in place of the ND2 filter to reduce the exposure to approximately 1/2. • Recording indoors for stable recording.	1/120
• Recording under bright sunlight. To avoid out-of-focus pictures while recording with small aperture.	1/100 to 1/50

When the ▶ indication in the viewfinder is blinking
The lighting condition is insufficient or excessive for the shutter priority mode. In this case, move the CONTROL dial and readjust the shutter speed.

Although we recommend camera recording without the ▶ indication blinking, camera recording can be performed even if the ▶ indication is blinking.
In this case, check the picture in the viewfinder before recording.

When is shutter speed 1/50 indicated?
1/50 indication is displayed only when the shutter speed is set to 1/50 using the CONTROL dial. Even though the shutter speed is set to 1/50 during the full automatic mode, the indication will not be displayed.

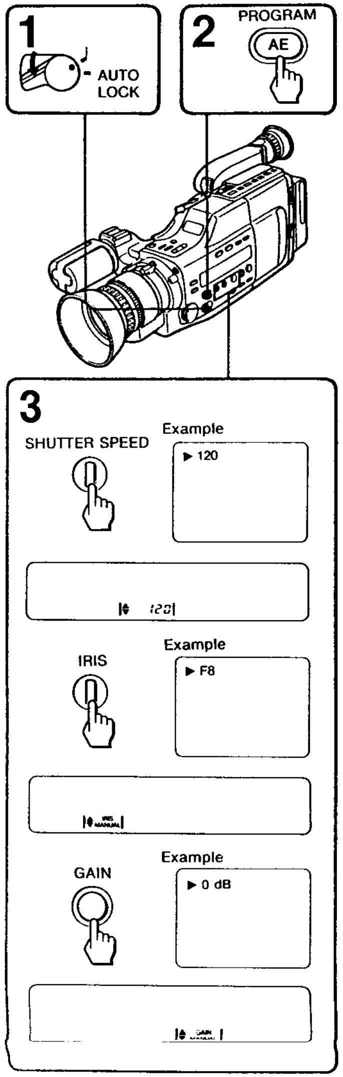
When the shutter speed is set 1/250 or faster
Try to shoot under sunlight outdoors, and with the video light indoors.

When shooting a very bright object
A vertical band (smear) may appear on the screen if shot at high speeds.

When the shutter speed is changed when shooting a TV screen
The brightness of the recorded picture may vary.

When recording under fluorescent, sodium, or mercury lamps
- The brightness of the recorded picture may flicker.
- The colour of the recorded picture may vary.

(e-1)


1
AUTO LOCK
2
PROGRAM
AE
3
SHUTTER SPEED
Example
▶ 120
IRIS
Example
▶ F8
GAIN
Example
▶ 0 dB

Manual Mode

In the manual mode, independent setting of the aperture value, shutter speeds, and gain can be performed. Setting of a single parameter or a combination of two or three parameters at one time is possible.

Setting One Parameter

(e-1)

1 **Set the AUTO LOCK switch down.**

2 **Press the PROGRAM AE button until nothing is indicated in the upper left hand corner of the viewfinder.**
The camcorder enters the manual mode.

At this point, the shutter speed is set to 1/50, the aperture and gain are automatically adjusted to the shooting condition.

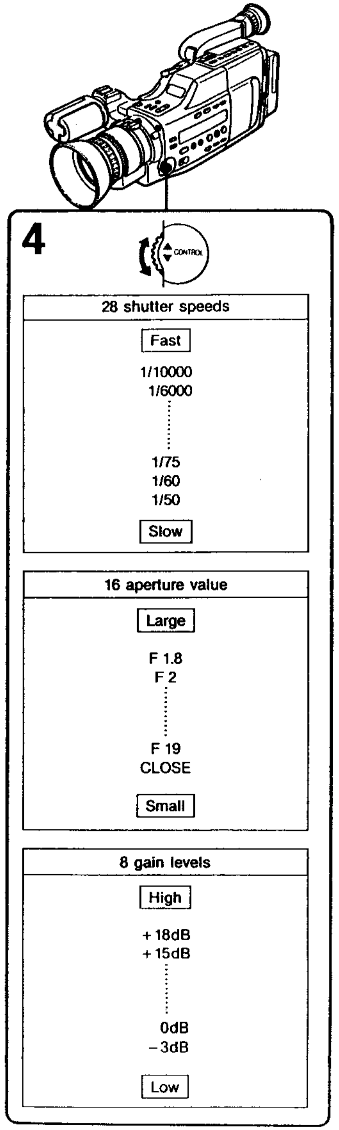
3 **Press the button of the parameter to be set.**

To set the shutter speed
The first press of the SHUTTER SPEED button sets the shutter speed to 1/120 speed and the second press sets it to 1/1000. To set to other speeds, go to step 4.

To set the aperture value
Press the IRIS button. The aperture is set to the value at the instant the button was pressed.

To set the gain
Press the GAIN button. The gain is set to the level at the instant the button was pressed.

Continued on the next page


4
CONTROL
28 shutter speeds
Fast
1/10000
1/6000
1/75
1/60
1/50
Slow
16 aperture value
Large
F 1.8
F 2
F 19
CLOSE
Small
8 gain levels
High
+18dB
+15dB
0dB
-3dB
Low

4 **Select the desired setting by the CONTROL dial.**

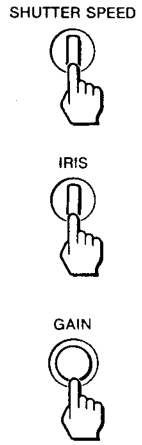
The indication in the viewfinder changes as shown in the illustration and below.

Selectable shutter speeds
1/50, 1/60, 1/75, 1/90, 1/100, 1/120, 1/150, 1/180, 1/215, 1/250, 1/300, 1/350, 1/425, 1/500, 1/600, 1/725, 1/850, 1/1000, 1/1250, 1/1500, 1/1750, 1/2000, 1/2500, 1/3000, 1/3500, 1/4000, 1/6000, and 1/10000

Selectable aperture value
F1.8, F2, F2.4, F2.8, F3.4, F4, F4.8, F5.6, F6.8, F8, F9.6, F11, F14, F16, F19, and CLOSE

Selectable gain level
-3 dB, 0 dB, +3 dB, +6 dB, +9 dB, +12 dB, +15 dB, and +18 dB

(e-2)



To return to the full automatic mode
Set the AUTO LOCK switch to AUTO LOCK.

To enter other programmed AE modes from the manual mode
Press the PROGRAM AE button to display the desired programmed AE mode.

When recording in the manual mode
Focus and white balance can be adjusted manually. See page 68 (focus) and page 71 (white balance) for details.

The buttons pressed and the indication in the viewfinder
(e-2)

- **When the SHUTTER SPEED button is pressed**

The first press of this button sets the camcorder to the 1/120 shutter speed. The second press sets the camcorder to the 1/1000 shutter speed. For a quick access to the desired shutter speed, first press the button and set to the shutter speed whichever is closer to the desired speed and then turn the CONTROL dial.

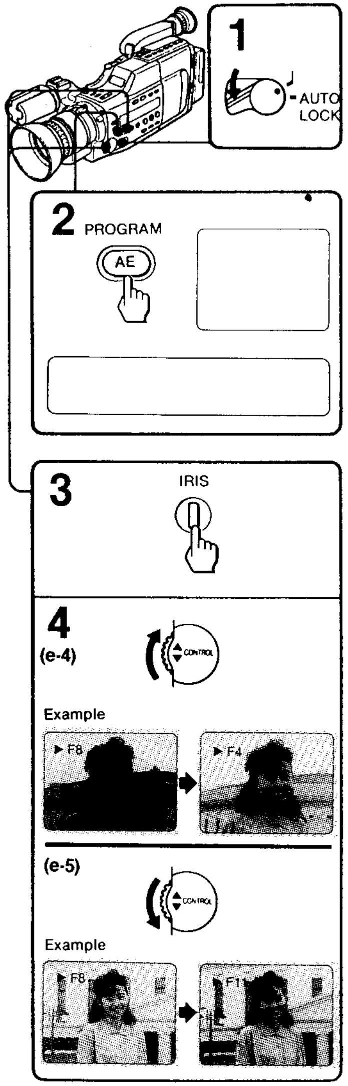
- **When the IRIS button is pressed**

The camcorder indicates the aperture value that was last detected when the camcorder was controlling the aperture automatically. At the same moment, though there is no indication, the gain level will be locked to match the aperture above to maintain the appropriate aperture.

- **When the GAIN button is pressed**

The camcorder indicates the gain level that was last detected when the camcorder was controlling the gain level automatically.
If aperture value was set first, the gain level to match that aperture value to maintain the appropriate exposure will be indicated in the viewfinder.

(e-3)



Aperture Control Applications

(e-3)

Adjust the exposure when there is an extreme difference in the brightness between the subject and the background.

1 **Set the AUTO LOCK switch down.**

2 **Press the PROGRAM AE button until nothing is indicated in the upper left hand corner of the viewfinder.**
The camcorder enters the manual mode.

At this point, the shutter speed is set to 1/50, the aperture and gain are automatically adjusted to the shooting condition.

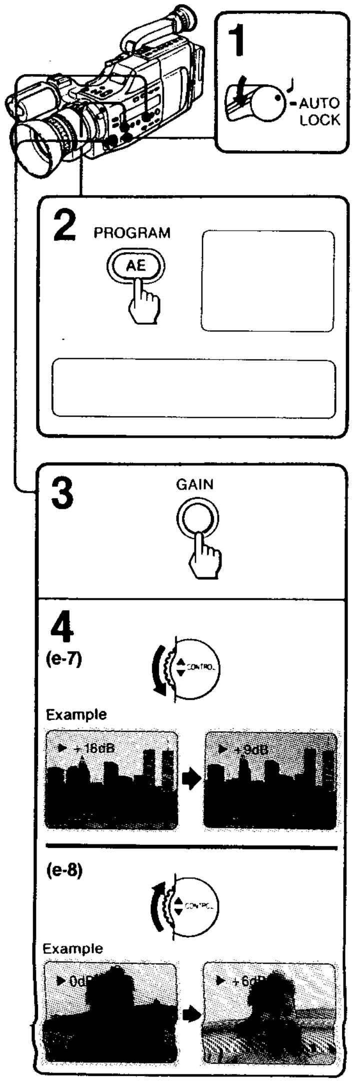
3 **Press the IRIS button.**

4 **Move the CONTROL dial to set the aperture to the appropriate value.**

Illumination from behind the subject and opposite the camera (Back light)
(e-4)
Move the CONTROL dial up to decrease the aperture value.

Illumination too strong
(e-5)
Move the CONTROL dial down to increase the aperture value.

(e-6)



Gain Level Control Applications

(e-6)

This camcorder automatically raises the gain level to capture the subject clearly when the shooting condition is dark. Due to this function, the recorded picture may seem brighter than the actual shooting condition. In these cases, set the gain level to reproduce the actual atmosphere. The gain level control can also be applied to adjusting the picture under back light condition without changing the depth of field.

1 **Set the AUTO LOCK switch down.**

2 **Press the PROGRAM AE button until nothing is indicated in the upper left hand corner of the viewfinder.**
The camcorder enters the manual mode.

At this point, the shutter speed is set to 1/50, the aperture and gain are automatically adjusted to the shooting condition.

3 **Press the GAIN button.**

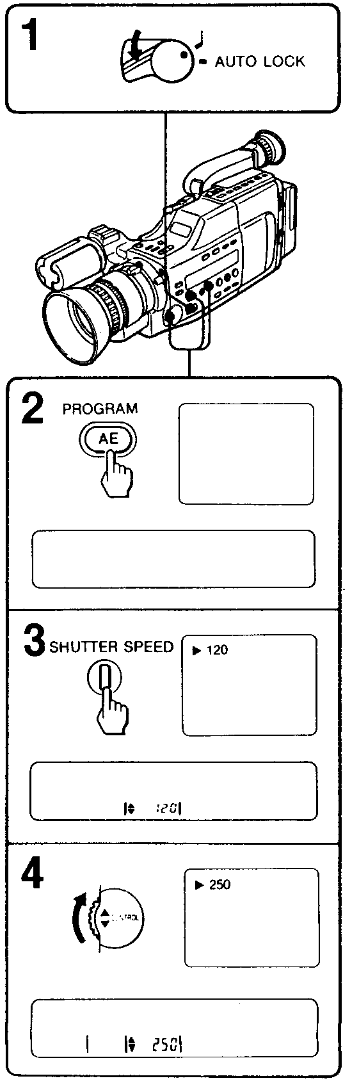
4 **Move the CONTROL dial to set the gain to the appropriate level.**

Shooting the picture in the dark effectively
(e-7)
Move the CONTROL dial down to lower the gain level.

Illumination from behind the subject and opposite the camera (Back light)
(e-8)
Move the CONTROL dial up to raise the gain level.

When the gain level is too high
The picture may become distorted.

(e-9)



Setting Multiple Parameters

(e-9)

Example: To set the shutter speed to 1/250, aperture value to F4, and gain level to +6dB.

1 **Set the AUTO LOCK switch down.**

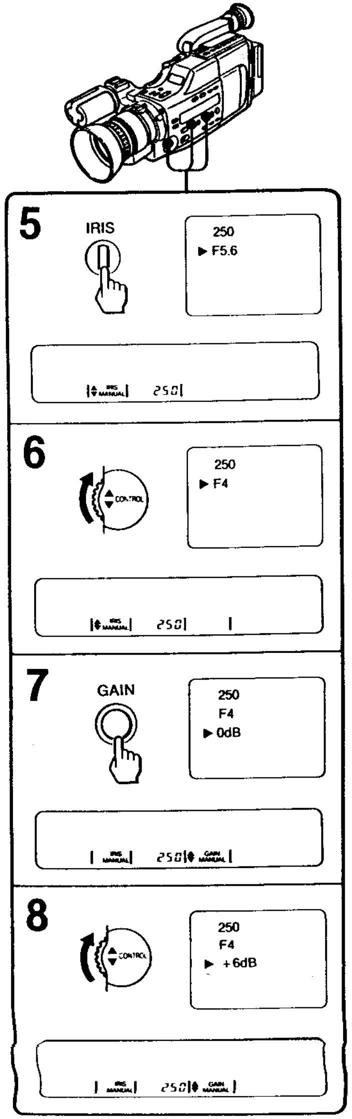
2 **Press the PROGRAM AE button until nothing is indicated in the upper left hand corner of the viewfinder.**
The camcorder enters the manual mode.

At this point, the shutter speed is set to 1/50, the aperture and gain are automatically adjusted to the shooting condition.

3 **Press the SHUTTER SPEED button.**

4 **Move the CONTROL dial and set the shutter speed to 250.**

Continued on the next page



5 **Press the IRIS button.**

6 **Move the CONTROL dial and set the aperture value to F4.**

7 **Press the GAIN button.**

8 **Move the CONTROL dial and set the gain level to +6dB.**

Camera recording will be performed under this setting even when the shooting condition changes.

To return to the full automatic mode
Set the AUTO LOCK switch to AUTO LOCK.

What parameter to set first
Setting can be performed from any parameter. Press the button of the desired parameter. The indication when the button is pressed is the same as those explained in page 104.

(e-10)

Parameter	Viewfinder (examples)		
SHUTTER SPEED	▶ 250	➡	
	▶ 250 F4	➡	▶ F4
	▶ 250 0dB	➡	▶ 0dB
	▶ 250 F4 0dB	➡	▶ F4 0dB
IRIS	▶ F1.8	➡	
	500 ▶ F1.8	➡	▶ 500
	▶ F1.8 +3dB	➡	▶ +3dB
	500 ▶ F1.8 +3dB	➡	500 ▶ +3dB
GAIN	▶ +6dB	➡	
	F2.8 ▶ +6dB	➡	▶ F2.8
	1000 ▶ +6dB	➡	▶ 1000
	1000 F2.8 ▶ +6dB	➡	1000 ▶ F2.8

To change the setting

- **Parameter with the ▶ indication:**
  Move the CONTROL dial to change the setting.

- **Parameter without the ▶ indication:**

1 **Press the button of the desired parameter to move the ▶ indication to that parameter.**

2 **Then move the CONTROL dial to change the setting.**

To quit the setting
(e-10)

- **Parameter with the ▶ indication:**
  Press the button of that parameter to erase the indication from the viewfinder.

- **Parameter without the ▶ indication:**

1 **Press the button of the parameter to be erased to move the ▶ indication to that parameter.**

2 **Then press the same button to erase that parameter from the viewfinder.**

When the parameter is erased
The adjustment of that parameter will be as follows.

- Shutter speed: Locked to 1/50.
- Aperture value: Automatic adjustment
- Gain level: Automatic adjustment. However, when the aperture value is in the viewfinder (i.e. locked to a certain value), gain will be set to the corresponding level to maintain the appropriate exposure.

(e-11)

	Aperture value	Shutter speed	Gain level
Selectable steps	16 steps	28 steps	8 steps
Variation of exposure (in terms of EV steps)	0.5 EV steps	0.25 EV steps 0.5 EV steps*	0.5 EV steps
Towards bright (+ EV)	F1.8	1/50	+18 dB
Towards dark (- EV)	F19	1/10000	-3 dB

*For shutter speeds between 1/4000 and 1/10000.

Advanced Application of the Manual Mode

The manual adjustment function offers an advanced video camera recording technique by controlling the exposure with the balance of shutter speed, aperture value and gain level.

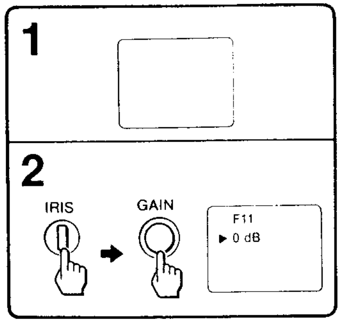
Understanding the relation between aperture value, shutter speed, and gain
Exposure is measured in the units of Exposure value (EV). In this camcorder, the total EV can be varied or kept at a constant level by controlling the balance of the parameters.

Refer to the chart on the left **(e-11)** for an overview of the relation between aperture value, shutter speed, and gain of this camcorder.

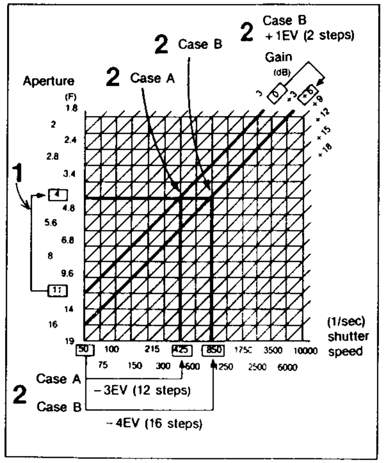
The relation between exposure and the aperture, shutter speed, and gain can be concluded as:

EV (Exposure value)	=	Aperture control	+	Shutter speed control	+	Gain control

(e-12)



(e-13)



Example: To change the setting without changing the exposure
(e-12)

1 **Set the camcorder to the manual mode referring to page 107.**

2 **Press the IRIS and GAIN buttons.**
At this point, the shutter speed is set to 1/50, the aperture and gain are set to the shooting condition. Let's suppose the aperture value is F11 and the gain level is 0 dB.

The setting at this point becomes the basic reference to perform the following setting.

Let's set the exposure at this point at 0 EV.

0 EV	=	Aperture control	+	Shutter speed control	+	Gain control

In order to maintain the same exposure, the total exposure should be kept to 0 EV in any case.

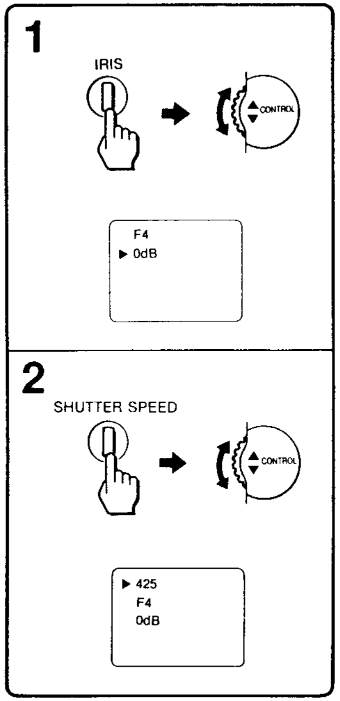
3 **Refer to the diagram (e-13) to choose the setting.**
The diagram shows the relation between aperture, shutter speed, and gain.

Setting in step 2 (on page 112 and 113)
Aperture value: F11
Shutter speed: 1/50
Gain level: 0dB

Vertical axis: Aperture value in 0.5EV/step
Horizontal axis: Shutter speed in 0.25EV/ step for shutter speeds between 1/50 and 1/4000, 0.5EV/step for shutter speeds between 1/4000 and 1/10000
Diagonal axis: Gain level in 0.5 EV/step

Continued on the next page

(e-14)



To set the aperture to F4 without changing the exposure
(e-13), (e-14)

1 **Press the IRIS button and move the CONTROL dial to set the aperture to F4.**
When shifting the aperture from F11 to F4, the exposure becomes 6 steps brighter. This means that in terms of EV, the total exposure becomes +3 EV. In order to keep the total exposure to 0 EV, reduce the exposure by −3 EV with shutter speed or gain.

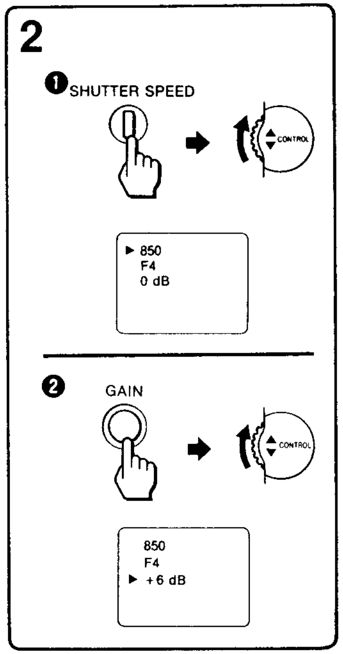
2 **Case A: To reduce the exposure by shutter speed**

How it works:
What is required here is to reduce the exposure by −3 EV, i.e.12 steps, by shifting the shutter speed from 1/50 to 1/425.

Operation:
Press the SHUTTER SPEED button and move the CONTROL dial to set the shutter speed to 1/425.

	Aperture control		Shutter speed control
0 EV =	F11 to F4	+	1/50 to 1/425
	+3 EV		−3 EV

Continued on the next page



Case B: To keep the shutter speed at 1/850 and to reduce the exposure by gain level.

How it works:
When setting the shutter speed to 1/850, the total exposure is reduced to −4 EV. This means that +1 EV, i.e. 2 steps, should be added by controlling the gain level. Therefore, shift the gain level from 0 dB to +6 dB.

Operation:
❶ Press the SHUTTER SPEED button and set the shutter speed to 1/850.
❷ Press the GAIN button and set the gain level to +6 dB.

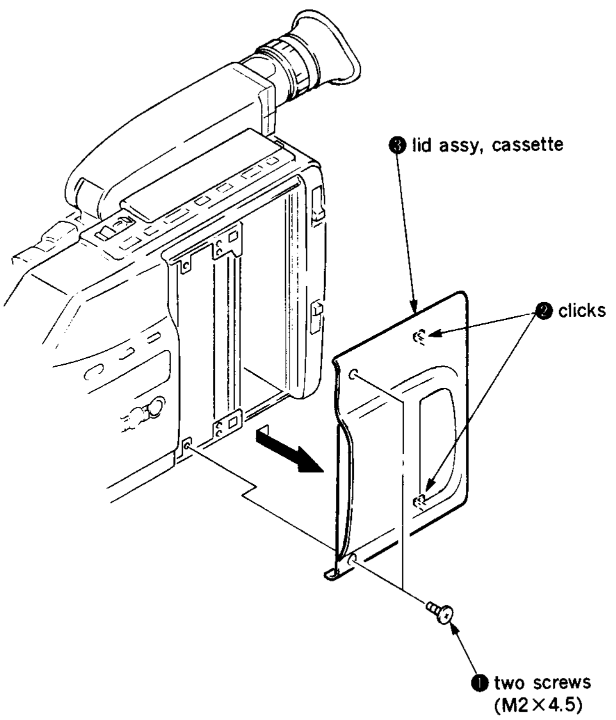
	Aperture control		Shutter speed control		Gain control
0 EV =	F11 to F4	+	1/50 to 1/850	+	0 dB to +6 dB
	+3 EV		−4 EV		+1 EV

Hint for effective camera work
Gain can be used in terms of film sensitivity of a still camera.

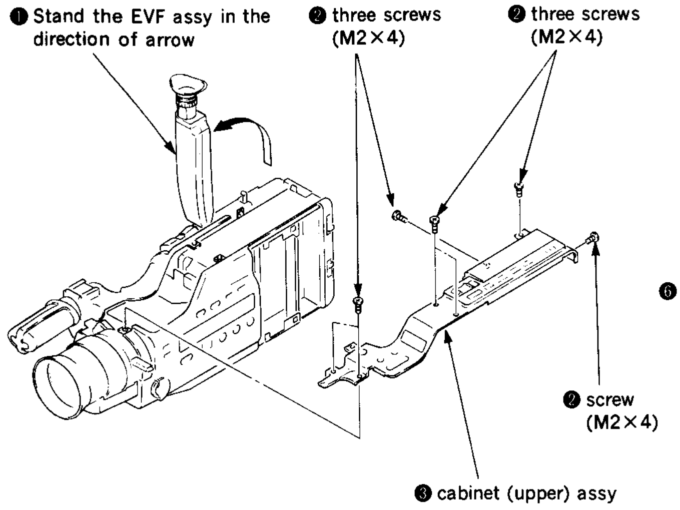
Notes
- When shooting outdoors, the brightness of the object may change due to the change of weather.
- When the shooting condition changes, resetting of the parameters is recommended.

SECTION 2
DISASSEMBLY

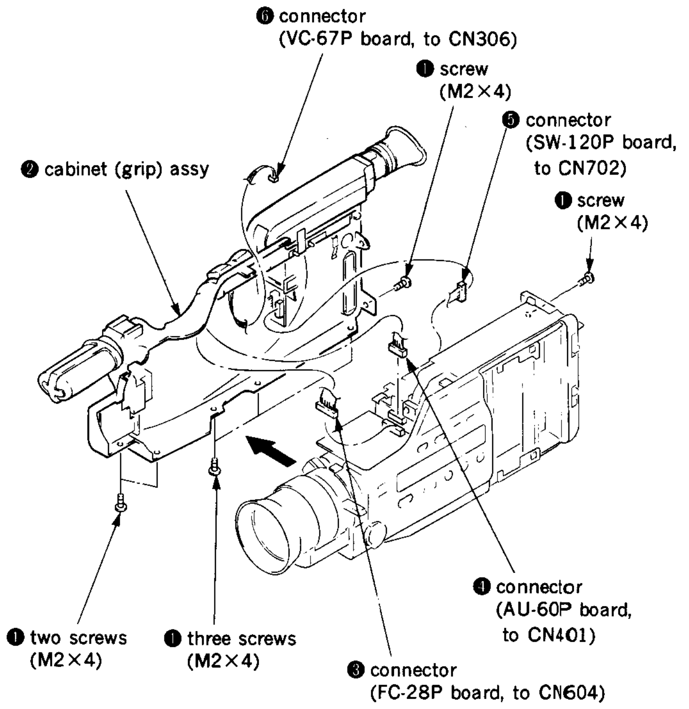
2-1. REMOVAL OF CASSETTE LID ASSY


❸ lid assy, cassette
❷ clicks
❶ two screws
(M2×4.5)

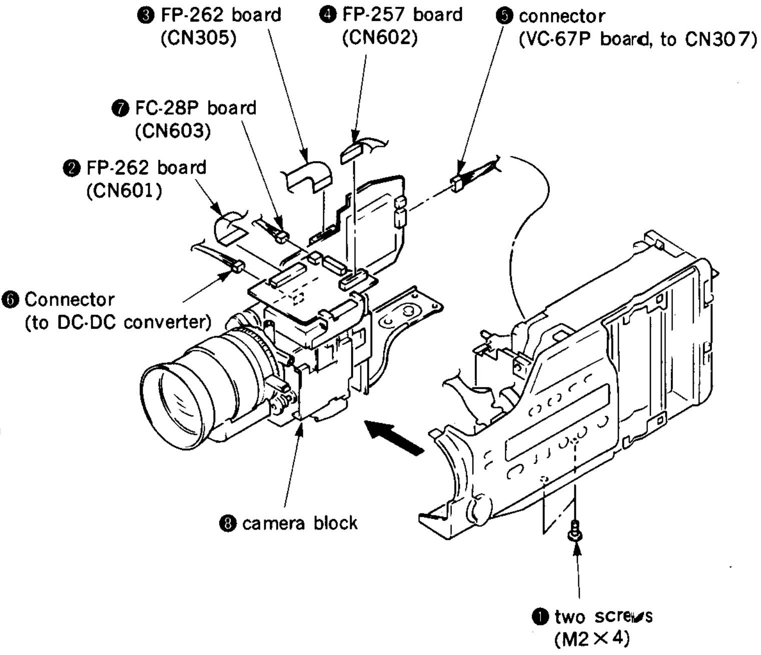
2-2. REMOVAL OF CABINET (UPPER) ASSY


❶ Stand the EVF assy in the direction of arrow
❷ three screws
(M2×4)
❷ three screws
(M2×4)
❷ screw
(M2×4)
❸ cabinet (upper) assy

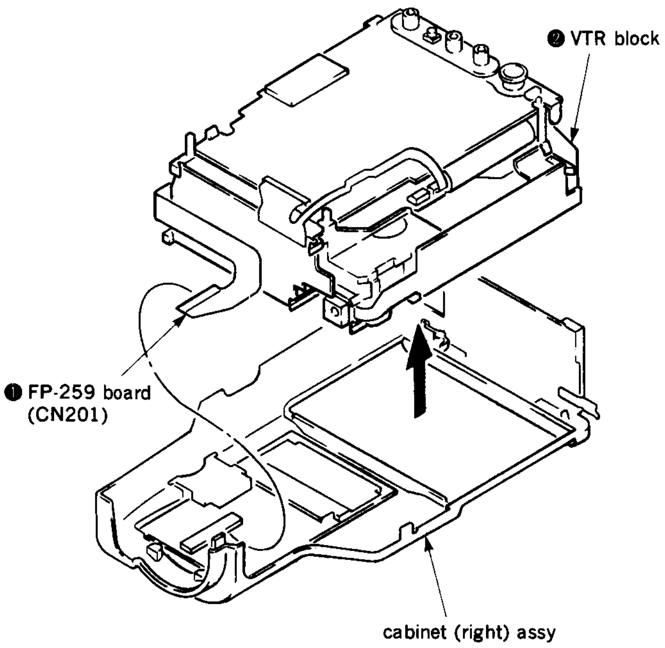
2-3. REMOVAL OF CABINET (GRIP) ASSY


❻ connector
(VC-67P board, to CN306)
❶ screw
(M2×4)
❺ connector
(SW-120P board, to CN702)
❶ screw
(M2×4)
❷ cabinet (grip) assy
❹ connector
(AU-60P board, to CN401)
❶ two screws
(M2×4)
❶ three screws
(M2×4)
❸ connector
(FC-28P board, to CN604)

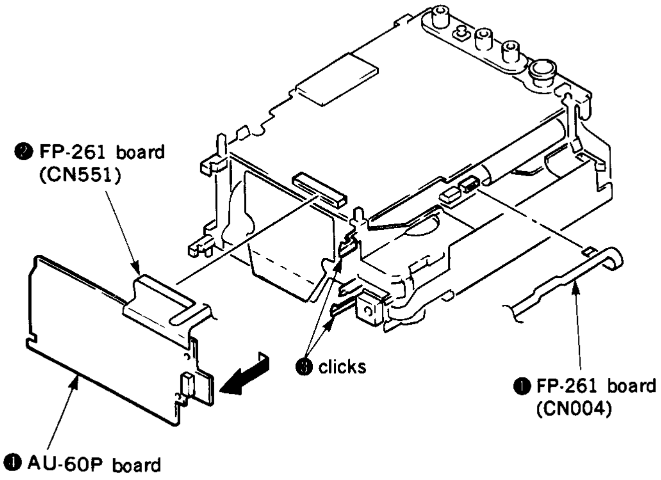
2-4. REMOVAL OF CAMERA BLOCK


❸ FP-262 board
(CN305)
❹ FP-257 board
(CN602)
❺ connector
(VC-67P board, to CN307)
❼ FC-28P board
(CN603)
❷ FP-262 board
(CN601)
❻ Connector
(to DC-DC converter)
❽ camera block
❶ two screws
(M2×4)

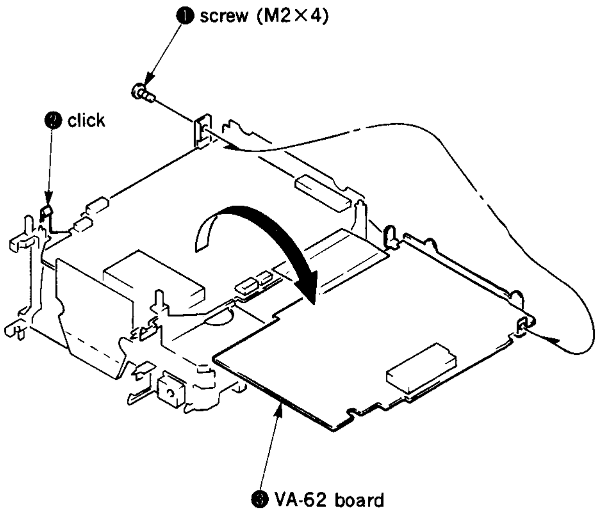
2-5. REMOVAL OF VTR BLOCK


❷ VTR block
❶ FP-259 board (CN201)
cabinet (right) assy

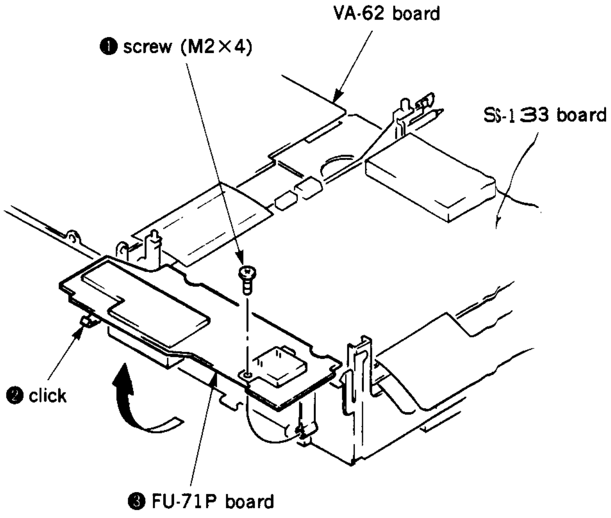
2-6. REMOVAL OF AU-60P BOARD


❷ FP-261 board (CN551)
❸ clicks
❶ FP-261 board (CN004)
❹ AU-60P board

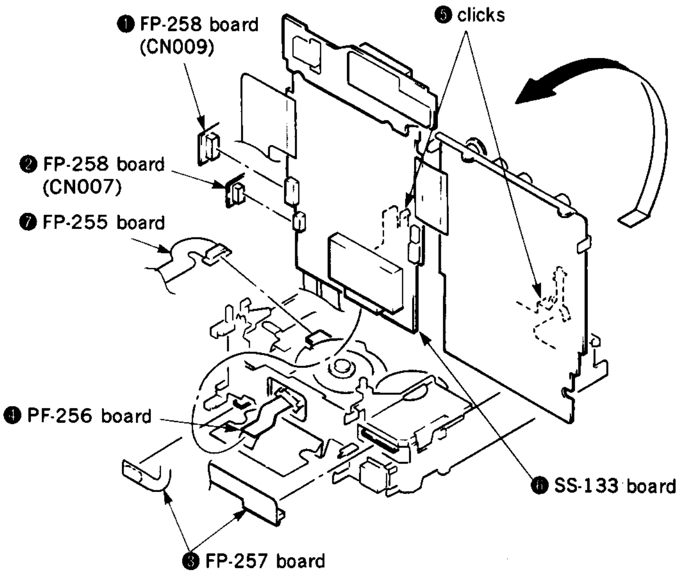
2-7. OPENING OF VA-62 BOARD


❶ screw (M2×4)
❷ click
❸ VA-62 board

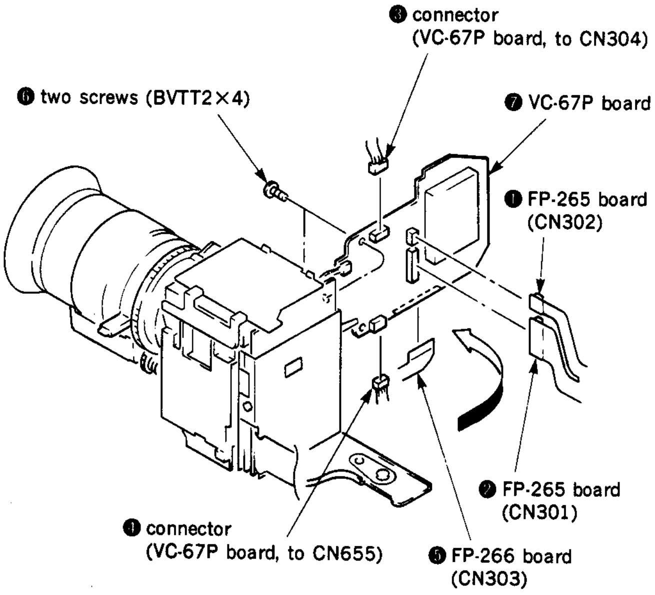
2-8. OPENING OF FU-71P BOARD


VA-62 board
❶ screw (M2×4)
SS-133 board
❷ click
❸ FU-71P board

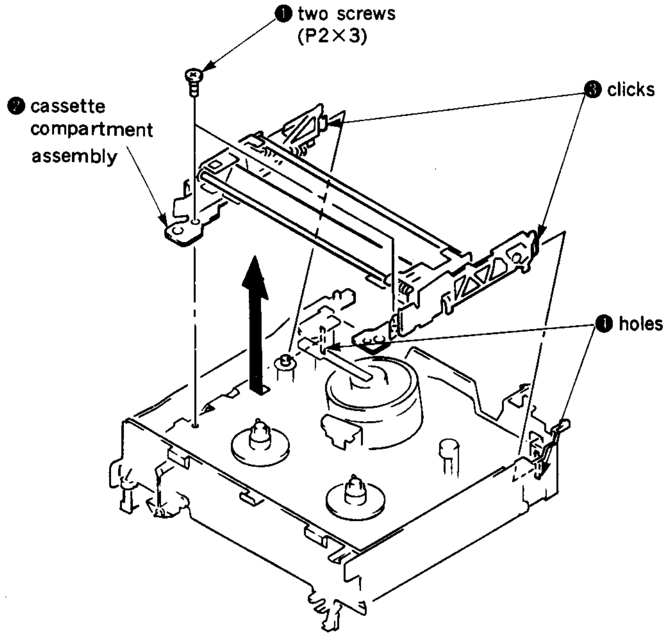
2-9. REMOVAL OF SS-133 BOARD


❶ FP-258 board (CN009)
❺ clicks
❷ FP-258 board (CN007)
❼ FP-255 board
❹ PF-256 board
❻ SS-133 board
❸ FP-257 board

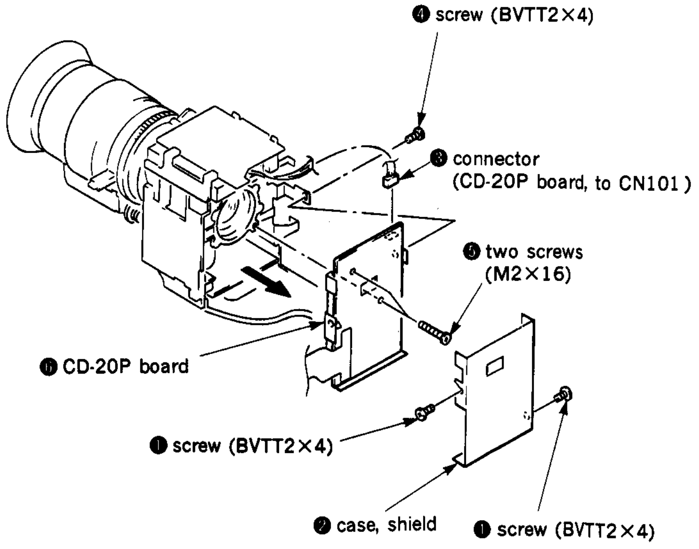
2-11. OPENING OF VC-67P BOARD


❸ connector (VC-67P board, to CN304)
❻ two screws (BVTT2×4)
❼ VC-67P board
❶ FP-265 board (CN302)
❷ FP-265 board (CN301)
❹ connector (VC-67P board, to CN655)
❺ FP-266 board (CN303)

2-10. REMOVAL OF CASSETTE COMPARTMENT ASSEMBLY

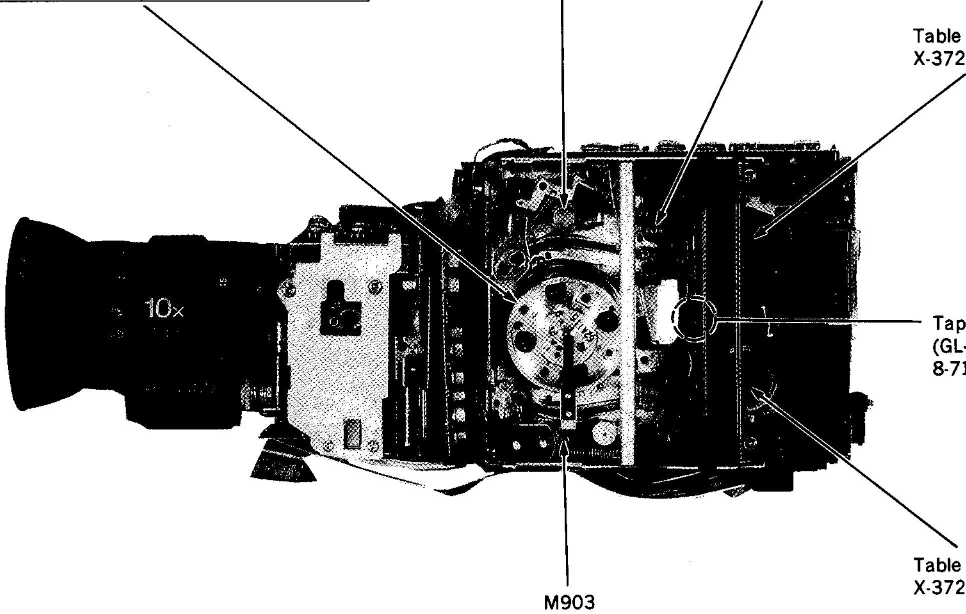

❶ two screws (P2×3)
❷ cassette compartment assembly
❸ clicks
❹ holes

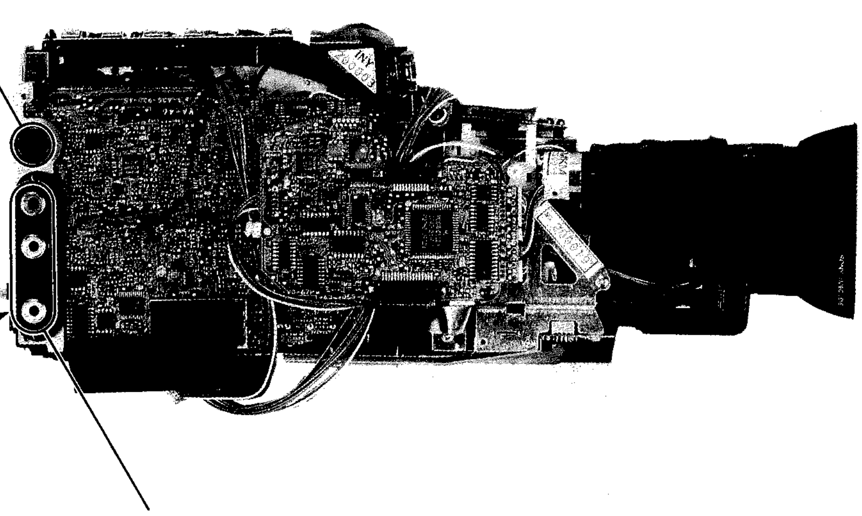
2-12. REMOVAL OF CD-20P BOARD


❹ screw (BVTT2×4)
❸ connector (CD-20P board, to CN101)
❺ two screws (M2×16)
❻ CD-20P board
❶ screw (BVTT2×4)
❷ case, shield
❶ screw (BVTT2×4)

2-13. INTERNAL VIEWS

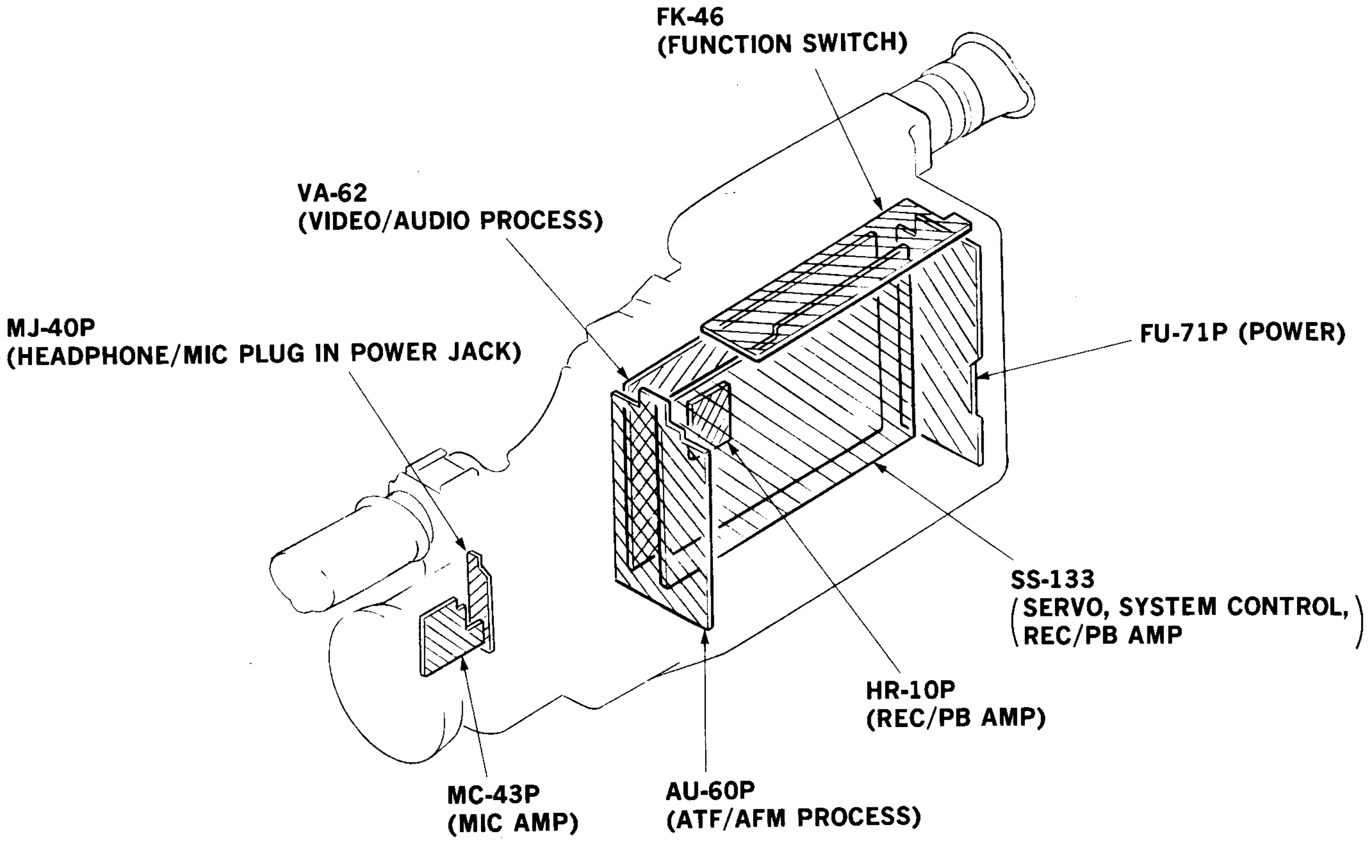
Drum ASSY (DGU-62A-R)	A-7048-403-A
Drum upper ASSY (DGR-62-R)	A-7049-341-A

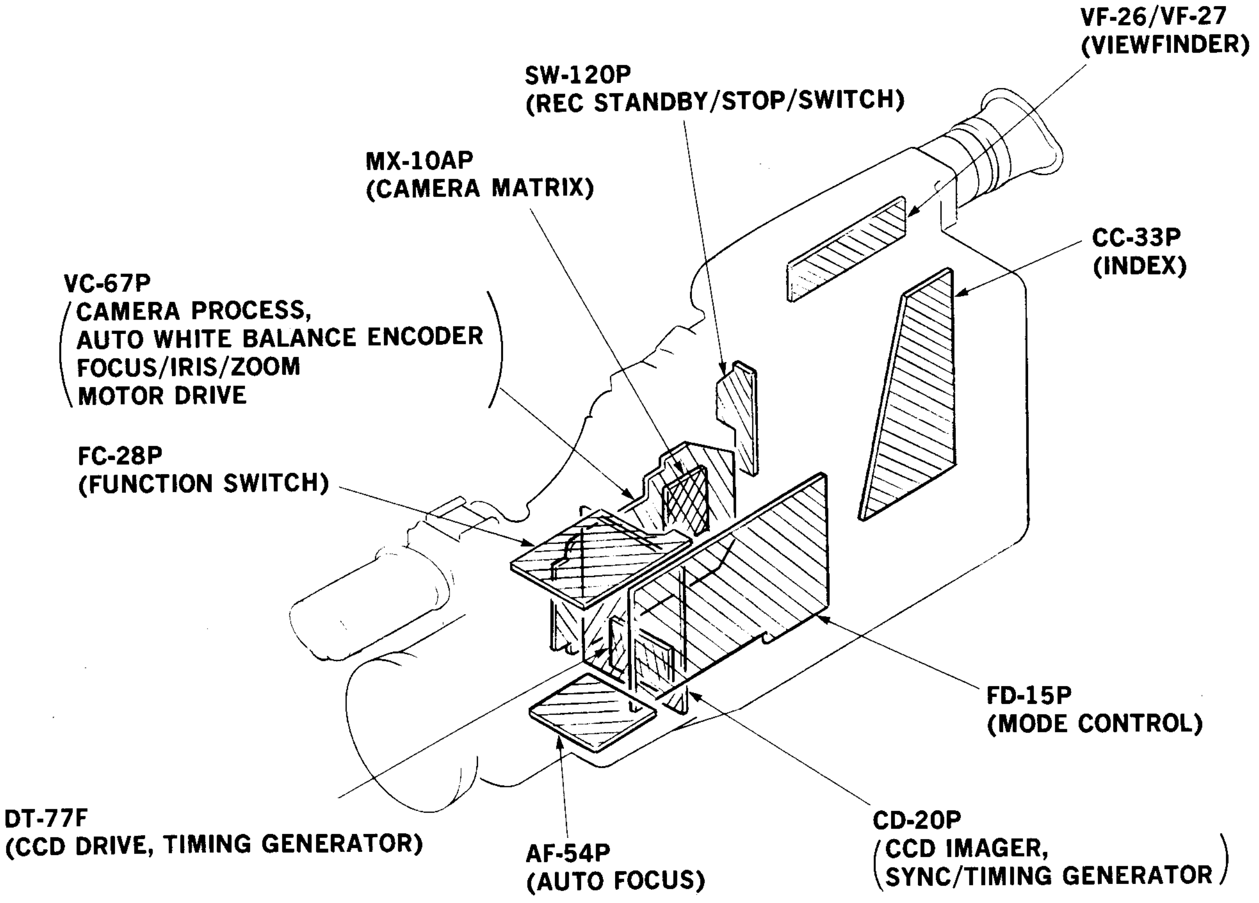

M902
Motor, capstan
8-835-331-01
Arm block assy, pinch
A-7040-219-A
Table assy, reel, take-up
X-3728-855-1
Tape top/Tape end LED
(GL-452S)
8-719-940-81
Table assy, reel, supply
X-3728-851-1
M903
Motor assy, loading
A-7040-208-A
10x


Connector, (S) terminal 4P
1-566-850-31
J101
Terminal board (battery)
1-537-241-11
Plate assy, jack
A-7091-210-A

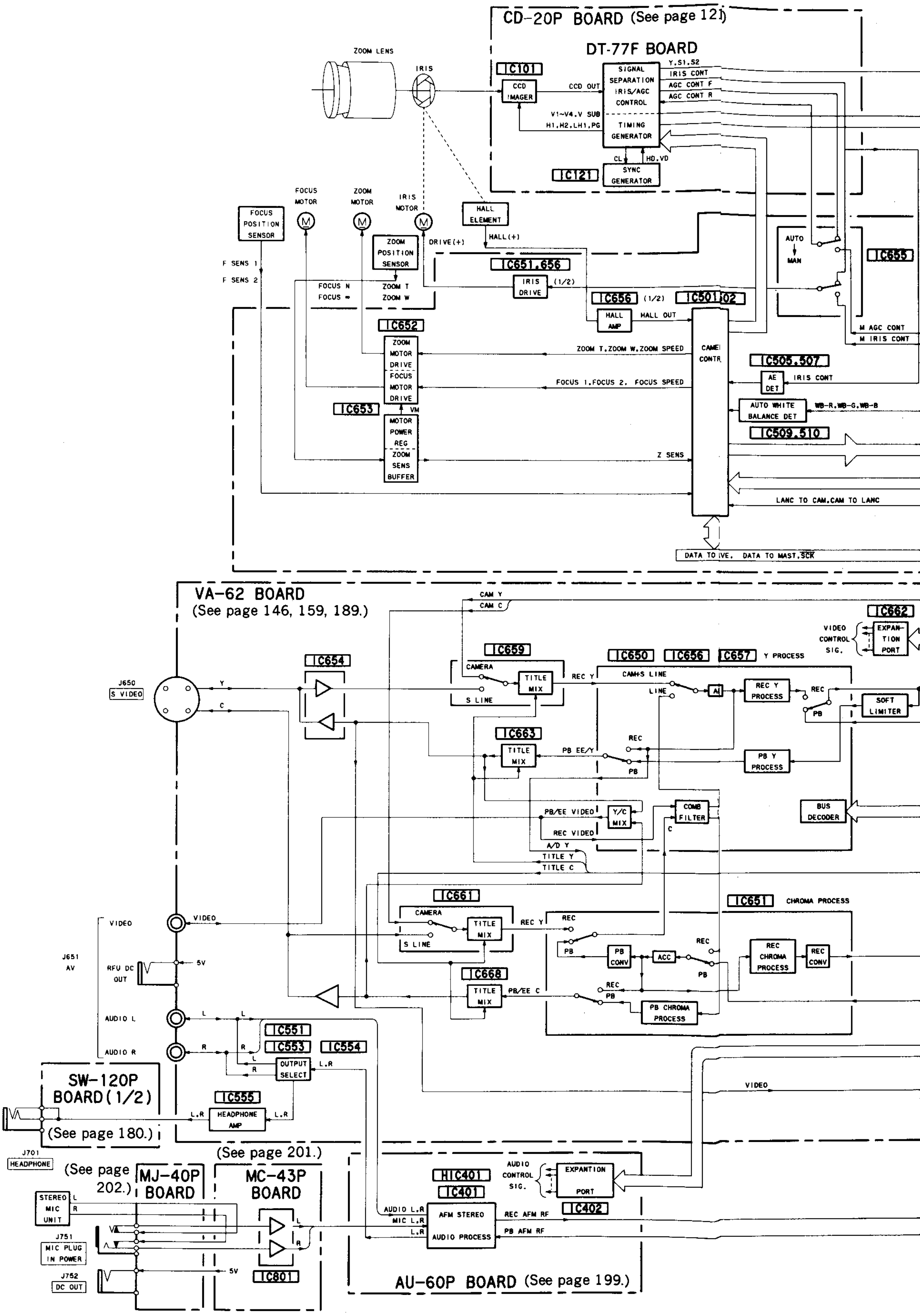
SECTION 3
DIAGRAMS

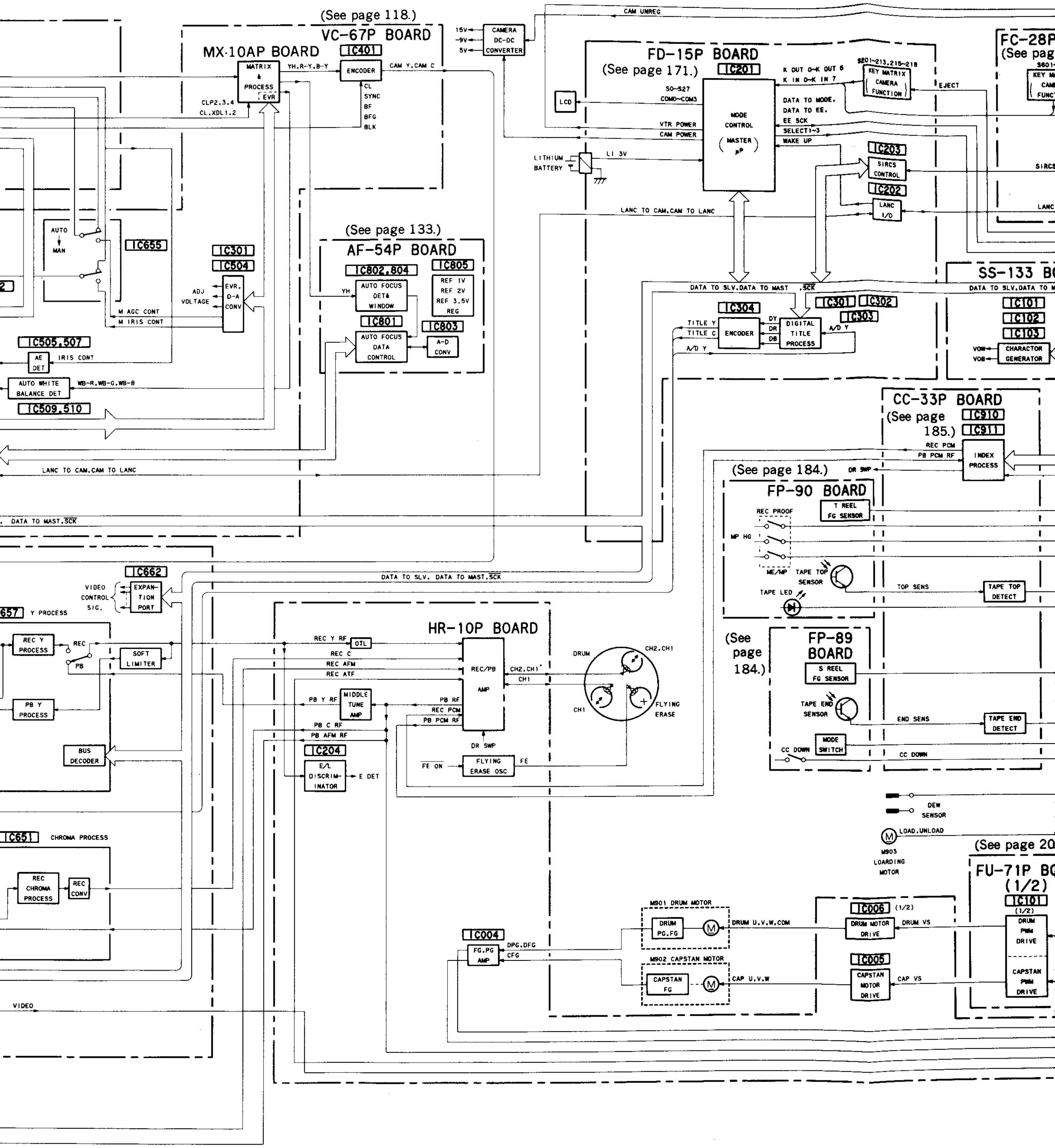
3-1. CIRCUIT BOARDS LOCATION

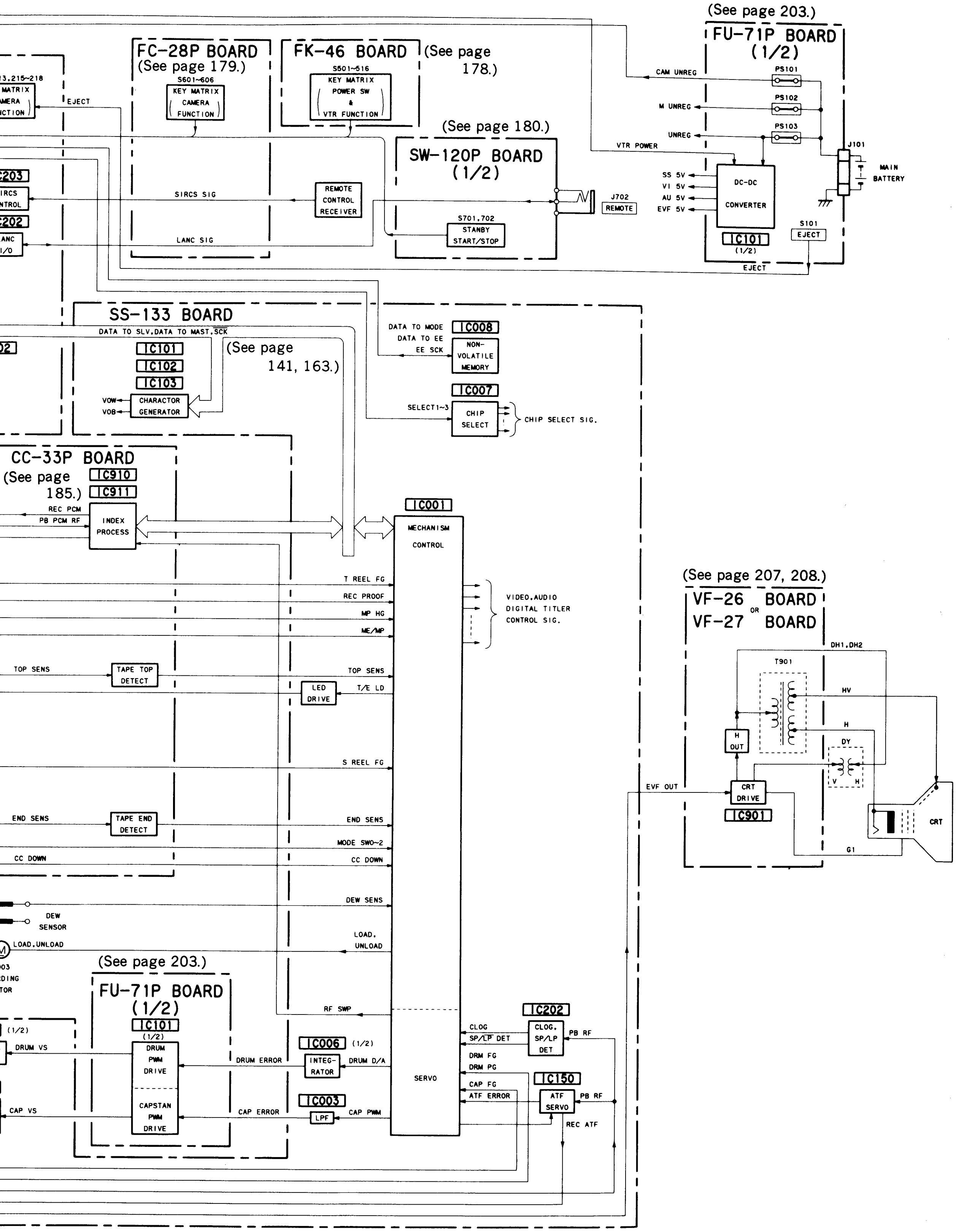

FK-46
(FUNCTION SWITCH)
VA-62
(VIDEO/AUDIO PROCESS)
MJ-40P
(HEADPHONE/MIC PLUG IN POWER JACK)
FU-71P (POWER)
SS-133
(SERVO, SYSTEM CONTROL, REC/PB AMP)
HR-10P
(REC/PB AMP)
MC-43P
(MIC AMP)
AU-60P
(ATF/AFM PROCESS)


VF-26/VF-27
(VIEWFINDER)
SW-120P
(REC STANDBY/STOP/SWITCH)
MX-10AP
(CAMERA MATRIX)
CC-33P
(INDEX)
VC-67P
(CAMERA PROCESS, AUTO WHITE BALANCE ENCODER FOCUS/IRIS/ZOOM MOTOR DRIVE)
FC-28P
(FUNCTION SWITCH)
FD-15P
(MODE CONTROL)
DT-77F
(CCD DRIVE, TIMING GENERATOR)
AF-54P
(AUTO FOCUS)
CD-20P
(CCD IMAGER, SYNC/TIMING GENERATOR)

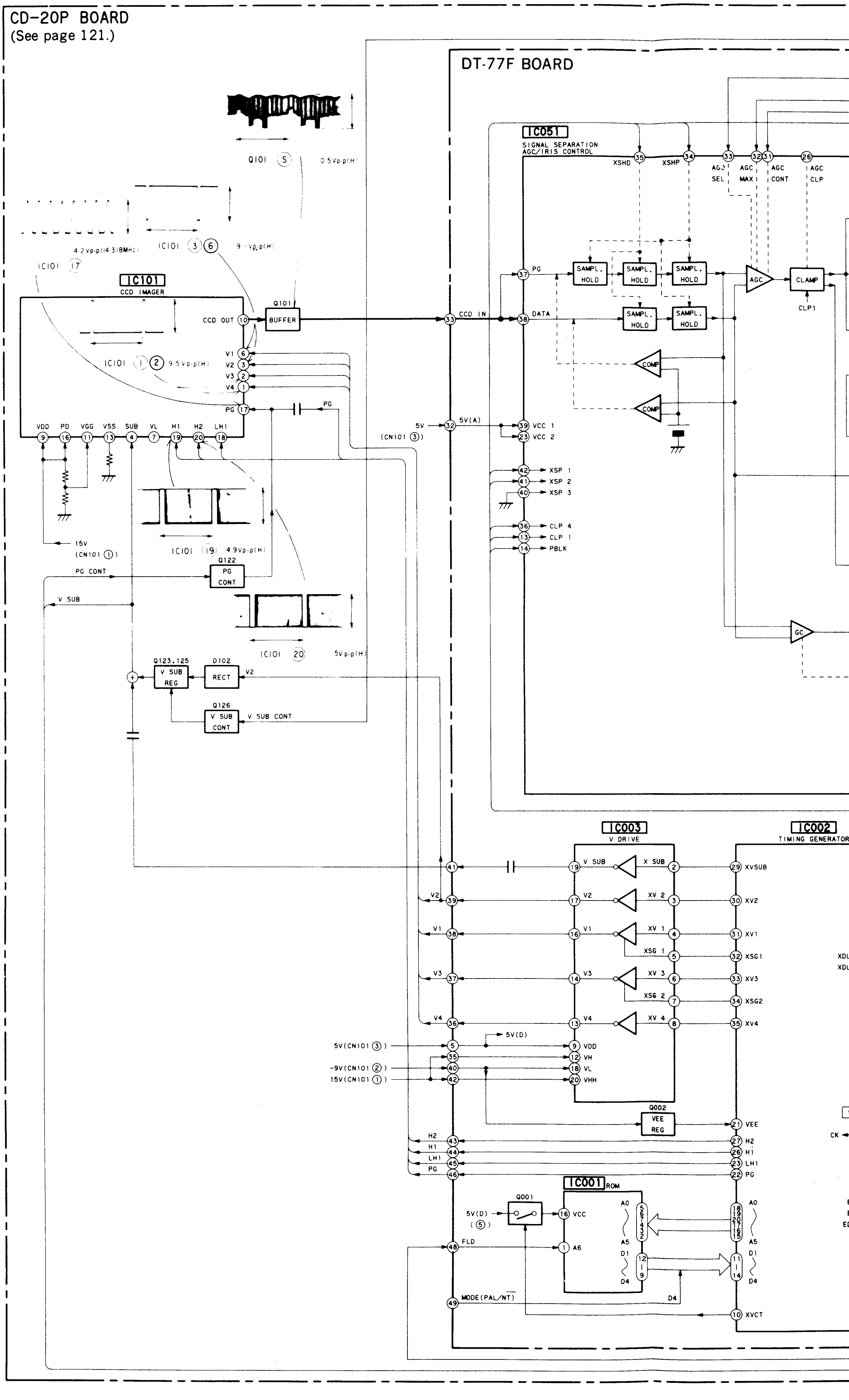
3-2. OVERALL BLOCK DIAGRAM

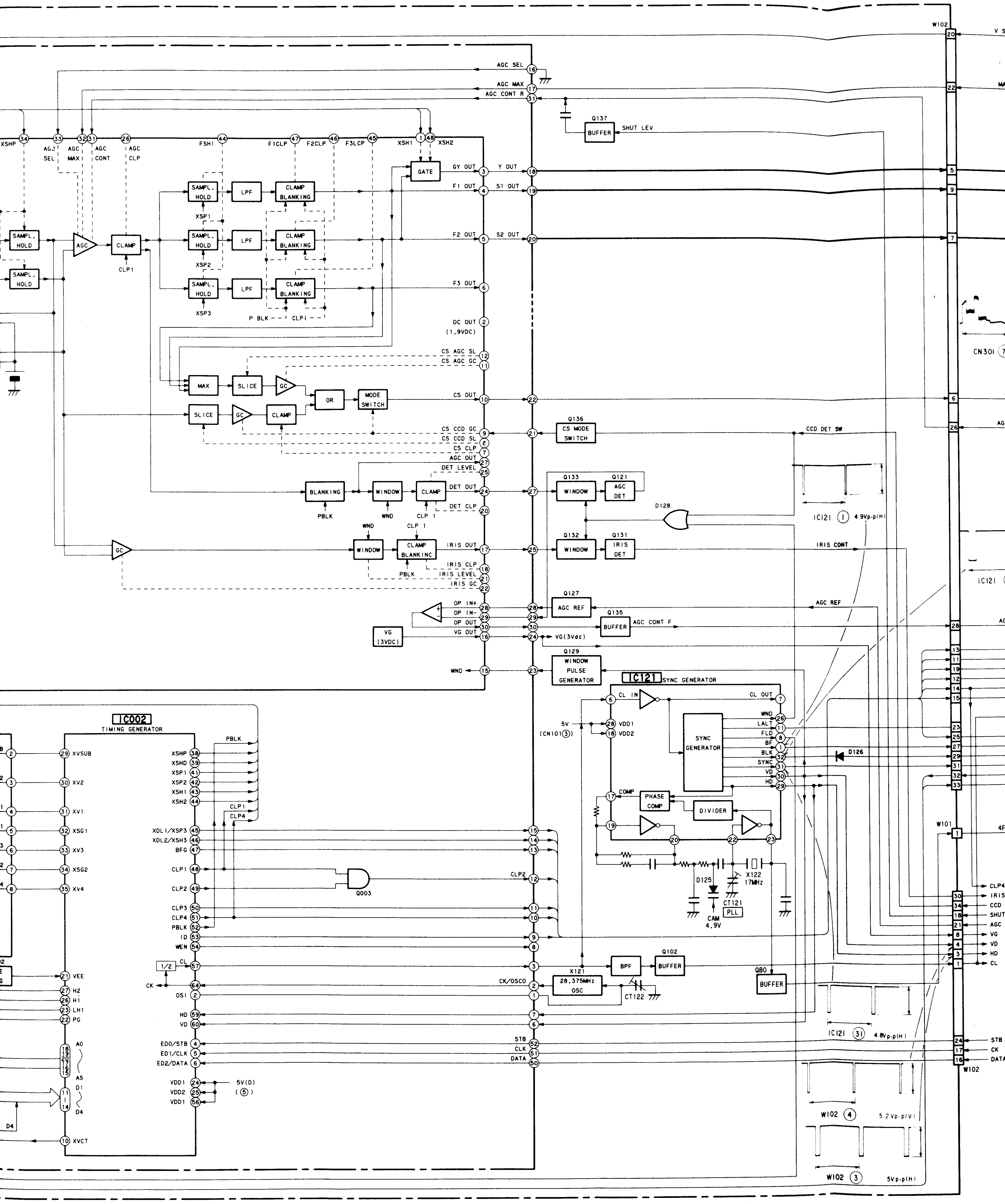

CD-20P BOARD (See page 121)
DT-77F BOARD
ZOOM LENS
IRIS
IC101
CCD IMAGER
CCD OUT
SIGNAL SEPARATION IRIS/AGC CONTROL
Y,S1,S2
IRIS CONT
AGC CONT F
AGC CONT R
V1~V4,V SUB
H1,H2,LH1,PG
TIMING GENERATOR
CL
HD,VD
IC121
SYNC GENERATOR
FOCUS MOTOR
ZOOM MOTOR
IRIS MOTOR
HALL ELEMENT
FOCUS POSITION SENSOR
ZOOM POSITION SENSOR
DRIVE(+)
HALL(+)
F SENS 1
F SENS 2
FOCUS N
FOCUS ∞
ZOOM T
ZOOM W
IC651,656
IRIS DRIVE
(1/2)
IC656
HALL AMP
HALL OUT
IC501,502
AUTO
MAN
IC655
M AGC CONT
M IRIS CONT
IC652
ZOOM MOTOR DRIVE
FOCUS MOTOR DRIVE
IC653
VM
MOTOR POWER REG
ZOOM SENS BUFFER
ZOOM T,ZOOM W,ZOOM SPEED
FOCUS 1,FOCUS 2, FOCUS SPEED
Z SENS
CAMERA CONTROL
IC505,507
AE DET
IRIS CONT
AUTO WHITE BALANCE DET
WB-R,WB-G,WB-B
IC509,510
LANC TO CAM,CAM TO LANC
DATA TO IVE, DATA TO MAST,SCK
VA-62 BOARD
(See page 146, 159, 189.)
CAM Y
CAM C
IC662
VIDEO CONTROL SIG.
EXPANTION PORT
IC654
J650
S VIDEO
Y
C
IC659
CAMERA
S LINE
TITLE MIX
REC Y
IC650
IC656
IC657
Y PROCESS
CAM+S LINE
LINE
REC Y PROCESS
REC
PB
SOFT LIMITER
IC663
TITLE MIX
PB EE/Y
REC
PB
PB Y PROCESS
PB/EE VIDEO
REC VIDEO
Y/C MIX
COMB FILTER
C
BUS DECODER
A/D Y
TITLE Y
TITLE C
IC661
CAMERA
S LINE
TITLE MIX
REC Y
IC651
CHROMA PROCESS
REC
PB
PB CONV
ACC
REC CHROMA PROCESS
REC CONV
IC668
TITLE MIX
PB/EE C
PB CHROMA PROCESS
VIDEO
J651
AV
VIDEO
RFU DC OUT
5V
AUDIO L
AUDIO R
L
R
IC551
IC553
IC554
OUTPUT SELECT
L,R
IC555
HEADPHONE AMP
SW-120P BOARD(1/2)
(See page 180.)
J701
HEADPHONE
(See page 202.)
MJ-40P BOARD
(See page 201.)
MC-43P BOARD
STEREO MIC UNIT
J751
MIC PLUG IN POWER
J752
DC OUT
5V
IC801
HIC401
IC401
AUDIO CONTROL SIG.
EXPANTION PORT
AUDIO L,R
MIC L,R
AFM STEREO AUDIO PROCESS
REC AFM RF
PB AFM RF
IC402
AU-60P BOARD (See page 199.)


(See page 118.)
VC-67P BOARD
MX-10AP BOARD
IC401
MATRIX & PROCESS
EVR
YH.R-Y.B-Y
ENCODER
CAM Y.CAM C
CL
SYNC
BF
BFG
BLK
CLP2.3.4
CL.XDL1.2
15V
-9V
5V
CAMERA DC-DC CONVERTER
CAM UNREG
FD-15P BOARD
(See page 171.)
IC201
LCD
S0~S27
COM0~COM3
VTR POWER
CAM POWER
MODE CONTROL
(MASTER µP)
K OUT 0~K OUT 6
K IN 0~K IN 7
S201~213.215~218
KEY MATRIX
CAMERA FUNCTION
EJECT
DATA TO MODE.
DATA TO EE.
EE SCK
SELECT1~3
WAKE UP
IC203
SIRCS CONTROL
IC202
LANC I/O
LITHIUM BATTERY
LI 3V
LANC TO CAM.CAM TO LANC
FC-28P
(See pag
S601
KEY M
CAM
FUNCT
SIRCS
LANC
AUTO
MAN
IC655
IC301
IC504
EVR. D-A CONV
ADJ VOLTAGE
M AGC CONT
M IRIS CONT
(See page 133.)
AF-54P BOARD
IC802.804
AUTO FOCUS DET& WINDOW
YH
IC805
REF 1V
REF 2V
REF 3.5V
REG
IC801
AUTO FOCUS DATA CONTROL
IC803
A-D CONV
IC505.507
AE DET
IRIS CONT
AUTO WHITE BALANCE DET
WB-R.WB-G.WB-B
IC509.510
LANC TO CAM.CAM TO LANC
DATA TO MAST.SCK
DATA TO SLV.DATA TO MAST
.SCK
IC304
IC301
IC302
IC303
TITLE Y
TITLE C
ENCODER
DY
DR
DB
DIGITAL TITLE PROCESS
A/D Y
SS-133 BO
DATA TO SLV.DATA TO M
IC101
IC102
IC103
VOW
VOB
CHARACTOR GENERATOR
CC-33P BOARD
(See page 185.)
IC910
IC911
REC PCM
PB PCM RF
INDEX PROCESS
DR SWP
(See page 184.)
FP-90 BOARD
T REEL FG SENSOR
REC PROOF
MP HG
ME/MP
TAPE TOP SENSOR
TAPE LED
TOP SENS
TAPE TOP DETECT
(See page 184.)
FP-89 BOARD
S REEL FG SENSOR
TAPE END SENSOR
END SENS
TAPE END DETECT
MODE SWITCH
CC DOWN
CC DOWN
IC662
VIDEO CONTROL SIG.
EXPANTION PORT
DATA TO SLV. DATA TO MAST.SCK
IC657
Y PROCESS
REC Y PROCESS
REC
PB
SOFT LIMITER
PB Y PROCESS
BUS DECODER
HR-10P BOARD
REC Y RF
OTL
REC C
REC AFM
REC ATF
REC/PB AMP
CH2.CH1
CH1
PB Y RF
MIDDLE TUNE AMP
PB RF
REC PCM
PB PCM RF
PB C RF
PB AFM RF
IC204
E/L DISCRIMINATOR
E DET
DR SWP
FE ON
FLYING ERASE OSC
FE
DRUM
CH2.CH1
CH1
FLYING ERASE
DEW SENSOR
M
LOAD.UNLOAD
M903 LOARDING MOTOR
IC651
CHROMA PROCESS
REC CHROMA PROCESS
REC CONV
(See page 20
FU-71P BO
(1/2)
IC101
(1/2)
DRUM PWM DRIVE
CAPSTAN PWM DRIVE
M901 DRUM MOTOR
DRUM PG.FG
DRUM U.V.W.COM
IC006 (1/2)
DRUM MOTOR DRIVE
DRUM VS
IC004
FG.PG AMP
DPG.DFG
CFG
M902 CAPSTAN MOTOR
CAPSTAN FG
CAP U.V.W
IC005
CAPSTAN MOTOR DRIVE
CAP VS
VIDEO

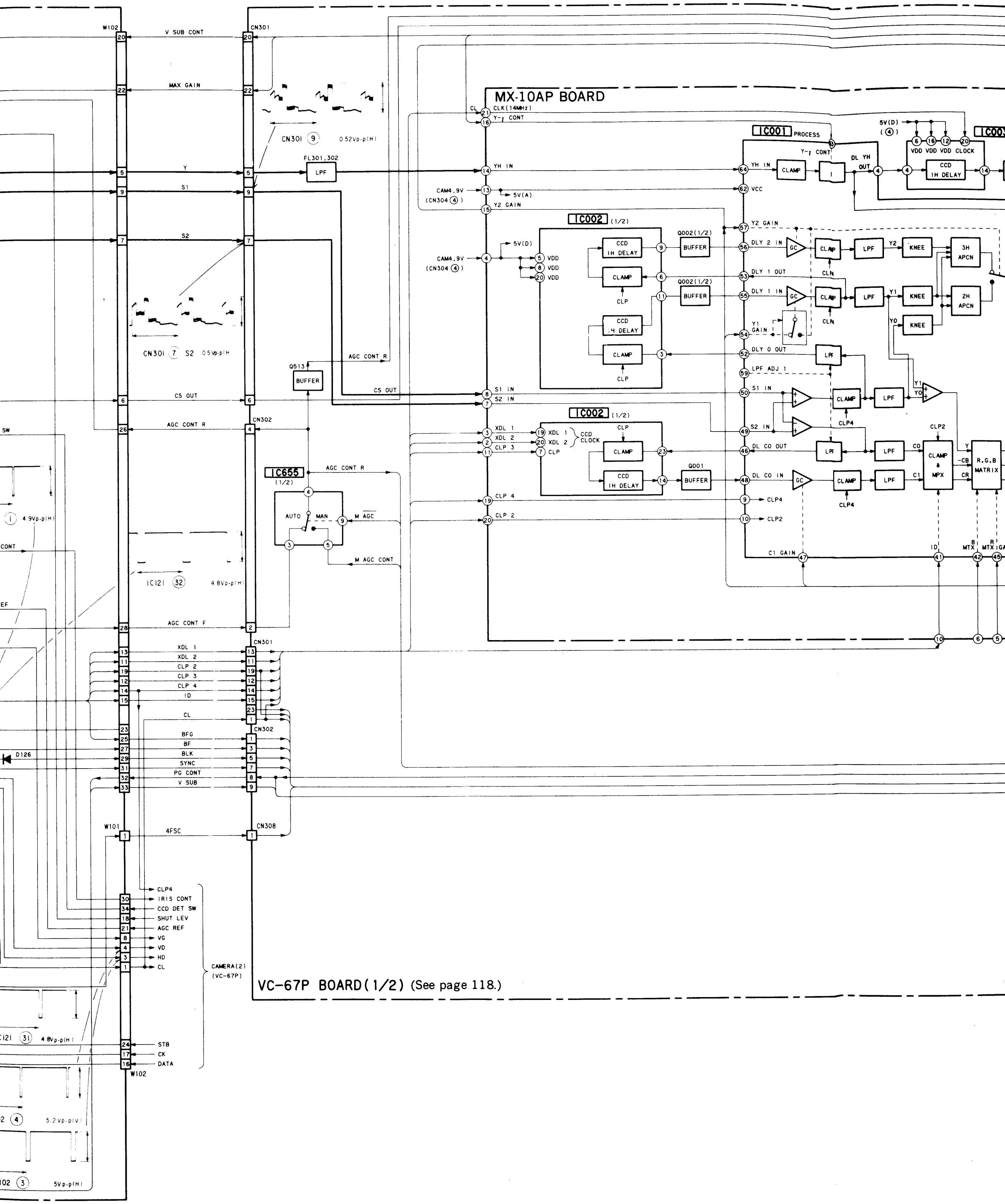

(See page 203.)
FU-71P BOARD (1/2)
CAM UNREG
M UNREG
UNREG
VTR POWER
PS101
PS102
PS103
J101
MAIN BATTERY
SS 5V
VI 5V
AU 5V
EVF 5V
DC-DC CONVERTER
IC101 (1/2)
S101 EJECT
EJECT
FC-28P BOARD
(See page 179.)
S601~606
KEY MATRIX CAMERA FUNCTION
FK-46 BOARD
(See page 178.)
S501~516
KEY MATRIX POWER SW & VTR FUNCTION
(See page 180.)
SW-120P BOARD (1/2)
REMOTE CONTROL RECEIVER
S701,702
STANBY START/STOP
J702 REMOTE
SIRCS SIG
LANC SIG
EJECT
3,215~218
MATRIX
MERA
CTION
C203
IRCS
NTROL
C202
ANC
/O
SS-133 BOARD
DATA TO SLV,DATA TO MAST,SCK
IC101
IC102
IC103
(See page 141, 163.)
VOW
VOB
CHARACTOR GENERATOR
02
DATA TO MODE
DATA TO EE
EE SCK
IC008
NON-VOLATILE MEMORY
IC007
SELECT1~3
CHIP SELECT
CHIP SELECT SIG.
CC-33P BOARD
(See page 185.)
IC910
IC911
REC PCM
PB PCM RF
INDEX PROCESS
IC001
MECHANISM CONTROL
T REEL FG
REC PROOF
MP HG
ME/MP
VIDEO,AUDIO DIGITAL TITLER CONTROL SIG.
TOP SENS
TAPE TOP DETECT
TOP SENS
LED DRIVE
T/E LD
S REEL FG
END SENS
TAPE END DETECT
END SENS
MODE SW0~2
CC DOWN
CC DOWN
DEW SENSOR
DEW SENS
LOAD,UNLOAD
LOAD, UNLOAD
03
DING
TOR
(See page 203.)
FU-71P BOARD (1/2)
IC101 (1/2)
DRUM PWM DRIVE
CAPSTAN PWM DRIVE
(1/2)
DRUM VS
CAP VS
RF SWP
DRUM ERROR
IC006 (1/2)
INTEG-RATOR
DRUM D/A
CAP ERROR
IC003
LPF
CAP PWM
SERVO
IC202
CLOG
SP/LP DET
CLOG, SP/LP DET
PB RF
DRM FG
DRM PG
CAP FG
ATF ERROR
IC150
ATF SERVO
PB RF
REC ATF
(See page 207, 208.)
VF-26 BOARD OR VF-27 BOARD
DH1,DH2
T901
HV
H
DY
V
H
H OUT
EVF OUT
CRT DRIVE
IC901
CRT
G1

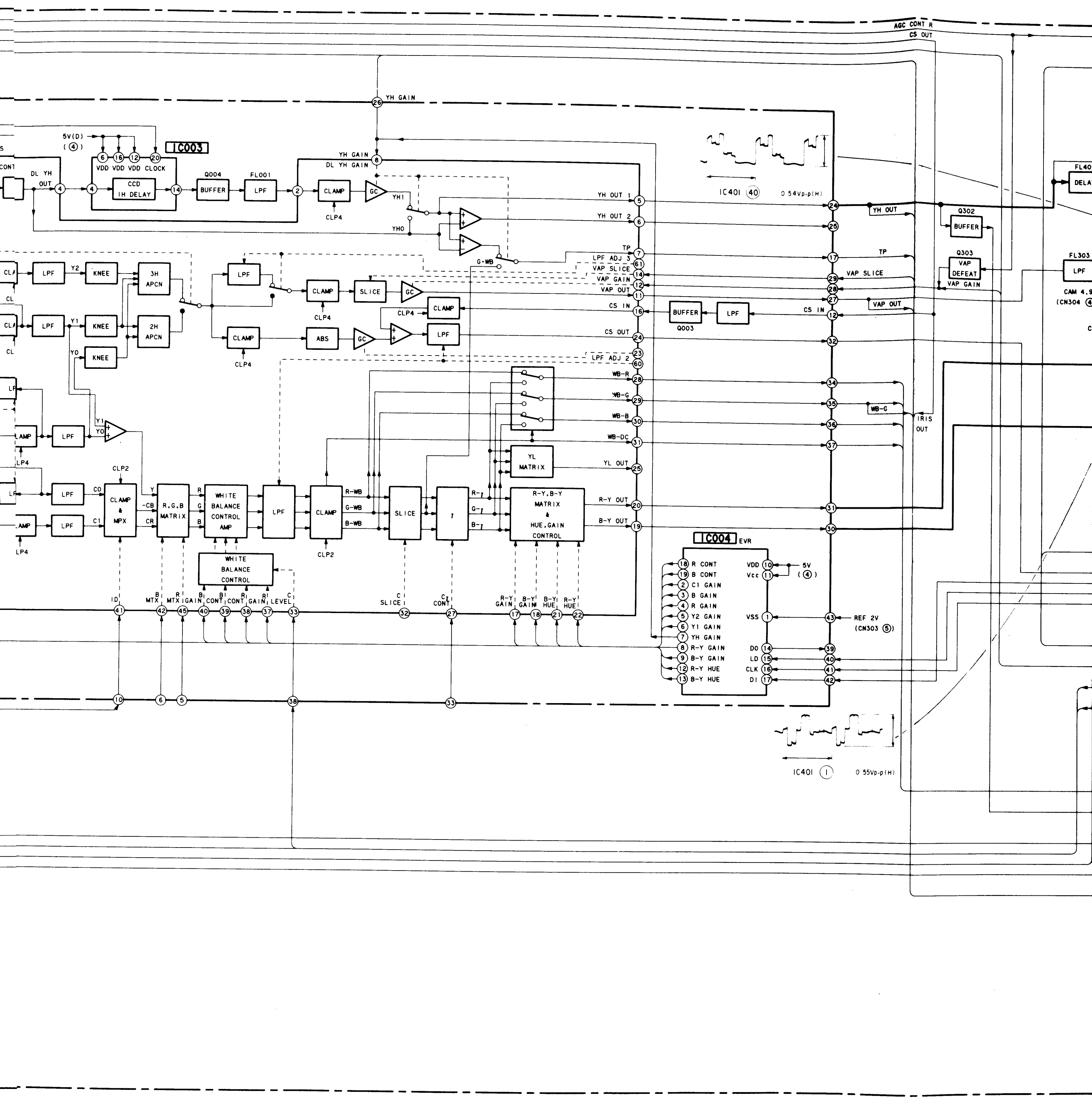
3-3. CAMERA (1) BLOCK DIAGRAM

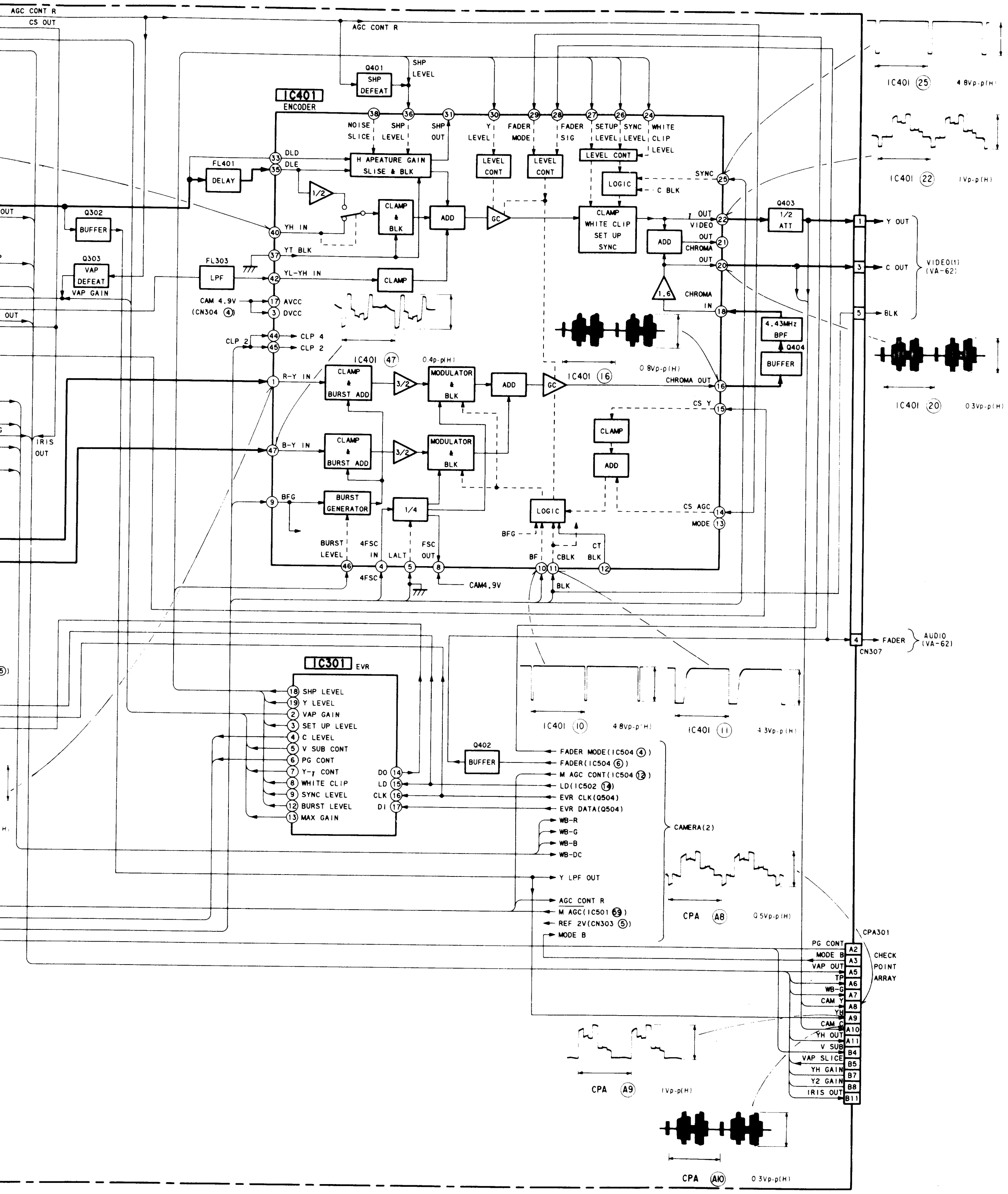

CD-20P BOARD
(See page 121.)
DT-77F BOARD
Q101 (S) 0.5Vp-p(H)
IC101 (3)(6) 9 Vp-p(H)
4.2Vp-p(4.318MHz)
IC101 (17)
IC101
CCD IMAGER
CCD OUT
Q101
BUFFER
V1
V2
V3
V4
PG
IC101 (1)(2) 9.5Vp-p(H)
VDD
PD
VGG
VSS
SUB
VL
H1
H2
LH1
15V
(CN101 ①)
PG CONT
Q122
PG CONT
V SUB
IC101 (19) 4.9Vp-p(H)
IC101 (20) 5Vp-p(H)
Q123,125
V SUB REG
D102
RECT
V2
Q126
V SUB CONT
V SUB CONT
5V
(CN101 ③)
5V(A)
CCD IN
IC051
SIGNAL SEPARATION AGC/IRIS CONTROL
XSHD
XSHP
AGC SEL
AGC MAX
AGC CONT
AGC CLP
PG
DATA
SAMPL. HOLD
AGC
CLAMP
CLP1
COMP
VCC 1
VCC 2
XSP 1
XSP 2
XSP 3
CLP 4
CLP 1
PBLK
GC
IC003
V DRIVE
V SUB
X SUB
V2
XV 2
V1
XV 1
XSG 1
V3
XV 3
XSG 2
V4
XV 4
5V(D)
VDD
VH
VL
VHH
5V(CN101 ③)
-9V(CN101 ②)
15V(CN101 ①)
Q002
VEE REG
H2
H1
LH1
PG
IC002
TIMING GENERATOR
XVSUB
XV2
XV1
XSG1
XV3
XSG2
XV4
VEE
H2
H1
LH1
PG
IC001
ROM
Q001
5V(D)
(⑤)
VCC
A0
A5
A6
D1
D4
FLD
MODE(PAL/NT)
D4
XVCT
CK



AGC SEL
AGC MAX
AGC CONT R
Q137
BUFFER
SHUT LEV
XSHP
AGC SEL
AGC MAX
AGC CONT
AGC CLP
FSH1
F1CLP
F2CLP
F3LCP
XSH1
XSH2
GATE
GY OUT
Y OUT
F1 OUT
S1 OUT
F2 OUT
S2 OUT
F3 OUT
SAMPL. HOLD
LPF
CLAMP BLANKING
XSP1
XSP2
XSP3
P BLK
CLP1
AGC
CLAMP
DC OUT (1.9VDC)
CS AGC SL
CS AGC GC
MAX
SLICE
GC
OR
MODE SWITCH
CS OUT
CS CCD GC
CS CCD SL
CS CLP
AGC OUT
DET LEVEL
DET OUT
DET CLP
Q136
CS MODE SWITCH
CCD DET SW
BLANKING
PBLK
WINDOW
WND
CLP 1
Q133
Q121
AGC DET
D128
IC121 ① 4.9Vp-p(H)
Q132
Q131
IRIS DET
IRIS CONT
IRIS OUT
IRIS CLP
IRIS LEVEL
IRIS GC
CLAMP BLANKINC
Q127
AGC REF
OP IN+
OP IN-
OP OUT
VG OUT
VG (3VDC)
Q135
AGC CONT F
VG(3Vdc)
Q129
WINDOW PULSE GENERATOR
WND
IC121
SYNC GENERATOR
CL IN
CL OUT
5V (CN101③)
VDD1
VDD2
LALT
FLD
BF
BLK
SYNC
VD
HD
COMP
PHASE COMP
DIVIDER
D126
D125
X122 17MHz
CT121 PLL
CAM 4.9V
IC002
TIMING GENERATOR
PBLK
XVSUB
XV2
XV1
XSG1
XV3
XSG2
XV4
XSHP
XSHD
XSP1
XSP2
XSH1
XSH2
CLP1
CLP4
XDL1/XSP3
XDL2/XSH3
BFG
CLP1
CLP2
CLP3
CLP4
PBLK
ID
WEN
Q003
1/2
CL
CK
CK/OSCO
OSI
X121 28.375MHz OSC
CT122
BPF
Q102
BUFFER
Q80
BUFFER
HD
VD
ED0/STB
ED1/CLK
ED2/DATA
STB
CLK
DATA
VDD1
VDD2
VDD1
5V(D) (⑤)
VEE
H2
H1
LH1
PG
A0
A5
D1
D4
XVCT
W102
W101
V S
MA
CN301
AG
IC121
IC121 ㉛ 4.8Vp-p(H)
W102 ④ 5.2Vp-p(V)
W102 ③ 5Vp-p(H)
CLP4
IRIS
CCD
SHUT
AGC
VG
VD
HD
CL
STB
CK
DATA


MX-10AP BOARD
VC-67P BOARD(1/2) (See page 118.)
W102
CN301
V SUB CONT
MAX GAIN
CN301 9 0.52Vp-p(H)
Y
S1
S2
FL301,302
LPF
CN301 7 S2 0.5Vp-p(H)
CS OUT
AGC CONT R
CN302
Q513
BUFFER
AGC CONT R
CS OUT
IC655 (1/2)
AUTO
MAN
M AGC
M AGC CONT
AGC CONT F
IC121 32 4.8Vp-p(H)
4.9Vp-p(H)
SW
CONT
EF
XDL 1
XDL 2
CLP 2
CLP 3
CLP 4
ID
CL
BFG
BF
BLK
SYNC
PG CONT
V SUB
D126
W101
4FSC
CN308
CLP4
IRIS CONT
CCD DET SW
SHUT LEV
AGC REF
VG
VD
HD
CL
CAMERA(2) (VC-67P)
STB
CK
DATA
IC121 31 4.8Vp-p(H)
2 4 5.2Vp-p(V)
102 3 5Vp-p(H)
CL
CLK(14MHz)
Y-γ CONT
YH IN
CAM4.9V (CN304 4)
5V(A)
Y2 GAIN
5V(D)
IC001 PROCESS
Y-γ CONT
CLAMP
DL YH OUT
5V(D) (4)
VDD VDD VDD CLOCK
CCD 1H DELAY
IC003
VCC
IC002 (1/2)
VDD
CCD 1H DELAY
CLAMP
CLP
Q002(1/2)
BUFFER
Y2 GAIN
DLY 2 IN
GC
CLAMP
LPF
Y2
KNEE
3H APCN
DLY 1 OUT
CLN
DLY 1 IN
Y1
2H APCN
Y1 GAIN
Y0
DLY 0 OUT
LPF ADJ 1
S1 IN
S2 IN
CLP4
Y1
Y0
XDL 1
XDL 2
CLP 3
CCD CLOCK
CLP
DL C0 OUT
DL C0 IN
Q001
C0
C1
CLP2
CLAMP & MPX
Y
-CB
CR
R.G.B MATRIX
CLP 4
CLP 2
C1 GAIN
ID
B MTX
R MTX
GA


AGC CONT R
CS OUT
YH GAIN
26
5V(D)
(④)
IC003
VDD VDD VDD CLOCK
CCD
1H DELAY
DL YH
OUT
Q004
BUFFER
FL001
LPF
YH GAIN
DL YH GAIN
CLAMP
GC
CLP4
YH1
YH0
YH OUT 1
YH OUT 2
TP
LPF ADJ 3
VAP SLICE
VAP GAIN
VAP OUT
CS IN
CS OUT
LPF ADJ 2
G-WB
LPF
KNEE
3H
APCN
2H
APCN
Y2
Y1
Y0
SLICE
ABS
BUFFER
Q003
WB-R
WB-G
WB-B
WB-DC
YL OUT
R-Y OUT
B-Y OUT
YL
MATRIX
R-Y,B-Y
MATRIX
&
HUE,GAIN
CONTROL
CLP2
CLAMP
&
MPX
C0
C1
-CB
CR
R,G,B
MATRIX
WHITE
BALANCE
CONTROL
AMP
WHITE
BALANCE
CONTROL
R-WB
G-WB
B-WB
R-γ
G-γ
B-γ
γ
ID
B MTX
R MTX
GAIN
B CONT
B CONT
R GAIN
R LEVEL
C SLICE
C CONT
R-Y GAIN
B-Y GAIN
B-Y HUE
R-Y HUE
IC004 EVR
R CONT
B CONT
C1 GAIN
B GAIN
R GAIN
Y2 GAIN
Y1 GAIN
YH GAIN
R-Y GAIN
B-Y GAIN
R-Y HUE
B-Y HUE
VDD
Vcc
VSS
DO
LD
CLK
DI
5V
(④)
REF 2V
(CN303 ⑤)
IC401 ㊵
0.54Vp-p(H)
IC401 ①
0.55Vp-p(H)
YH OUT
TP
VAP SLICE
VAP OUT
CS IN
WB-G
IRIS
OUT
Q302
BUFFER
Q303
VAP
DEFEAT
VAP GAIN
FL303
LPF
CAM 4.9
(CN304 ④)
FL40
DELA


AGC CONT R
CS OUT
AGC CONT R
Q401
SHP DEFEAT
SHP LEVEL
IC401
ENCODER
NOISE SLICE
SHP LEVEL
SHP OUT
Y LEVEL
FADER MODE
FADER SIG
SETUP LEVEL
SYNC LEVEL
WHITE CLIP LEVEL
FL401
DELAY
DLD
DLE
H APEATURE GAIN SLISE & BLK
1/2
CLAMP & BLK
ADD
GC
LEVEL CONT
LEVEL CONT
LEVEL CONT
LOGIC
C BLK
SYNC
CLAMP WHITE CLIP SET UP SYNC
Y OUT
VIDEO OUT
CHROMA OUT
ADD
1.6
CHROMA IN
Q403
1/2 ATT
4.43MHz BPF
Q404
BUFFER
Q302
BUFFER
Q303
VAP DEFEAT
VAP GAIN
YH IN
YT BLK
FL303
LPF
YL-YH IN
CLAMP
CAM 4.9V
(CN304 ④)
AVCC
DVCC
CLP 2
CLP 4
CLP 2
IC401 (47)
0.4p-p(H)
R-Y IN
CLAMP & BURST ADD
3/2
MODULATOR & BLK
ADD
GC
IC401 (16)
0.8Vp-p(H)
CHROMA OUT
CS Y
CLAMP
ADD
B-Y IN
CLAMP & BURST ADD
3/2
MODULATOR & BLK
BFG
BURST GENERATOR
1/4
LOGIC
CS AGC
MODE
BFG
BURST LEVEL
4FSC IN
LALT
FSC OUT
BF
CBLK
CT BLK
4FSC
CAM4.9V
BLK
IRIS OUT
OUT
OUT
IC401 (25)
4.8Vp-p(H)
IC401 (22)
1Vp-p(H)
IC401 (20)
0.3Vp-p(H)
Y OUT
C OUT
VIDEO(1) (VA-62)
BLK
FADER
AUDIO (VA-62)
CN307
IC301
EVR
SHP LEVEL
Y LEVEL
VAP GAIN
SET UP LEVEL
C LEVEL
V SUB CONT
PG CONT
Y-γ CONT
WHITE CLIP
SYNC LEVEL
BURST LEVEL
MAX GAIN
DO
LD
CLK
DI
Q402
BUFFER
IC401 (10)
4.8Vp-p(H)
IC401 (11)
4.3Vp-p(H)
FADER MODE(IC504 ④)
FADER(IC504 ⑥)
M AGC CONT(IC504 ⑫)
LD(IC502 ⑭)
EVR CLK(Q504)
EVR DATA(Q504)
WB-R
WB-G
WB-B
WB-DC
CAMERA(2)
Y LPF OUT
AGC CONT R
M AGC(IC501 (59))
REF 2V(CN303 ⑤)
MODE B
CPA (A8)
0.5Vp-p(H)
CPA301
PG CONT
MODE B
VAP OUT
TP
WB-G
CAM Y
YH
CAM C
YH OUT
V SUB
VAP SLICE
YH GAIN
Y2 GAIN
IRIS OUT
A2
A3
A5
A6
A7
A8
A9
A10
A11
B4
B5
B7
B8
B11
CHECK POINT ARRAY
CPA (A9)
1Vp-p(H)
CPA (A10)
0.3Vp-p(H)

3-4. CAMERA SYSTEM CONTROL VC-67P BOARD IC501 (MC68HC11E9)

〔Description〕

MC68HC11E9 is a 8-bit one-chip micro controller with a built-in nonvolatile memory (EEPROM). All the camera system, which has been composed by mere than one, can be controlled by only this micro controller. In addition, protocol master control of the LANC communication can be performed.

1. Function

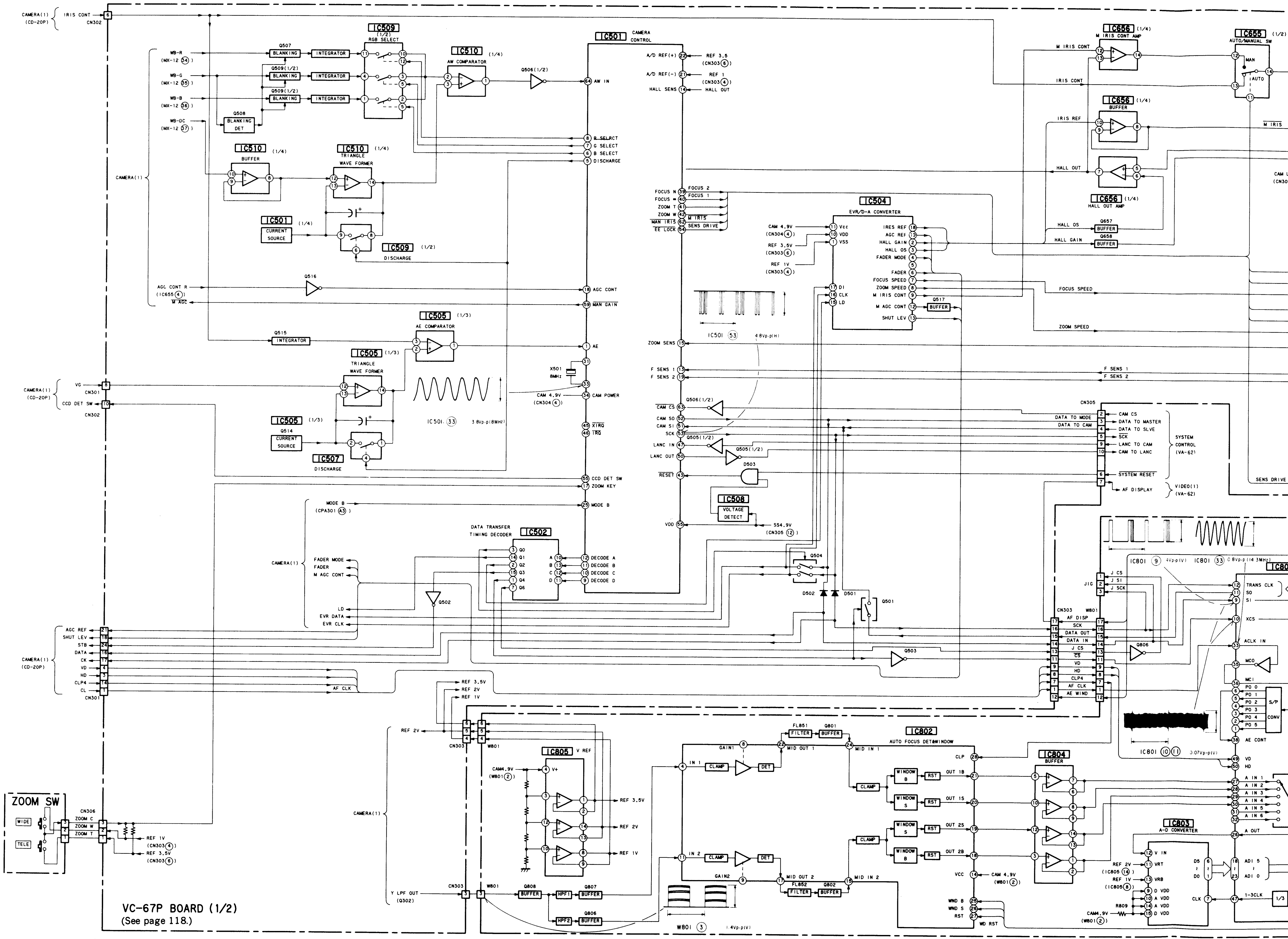
1) EVR Control
2) AWB Control
3) AE Control
4) AF Control
5) LANC communication protocol control

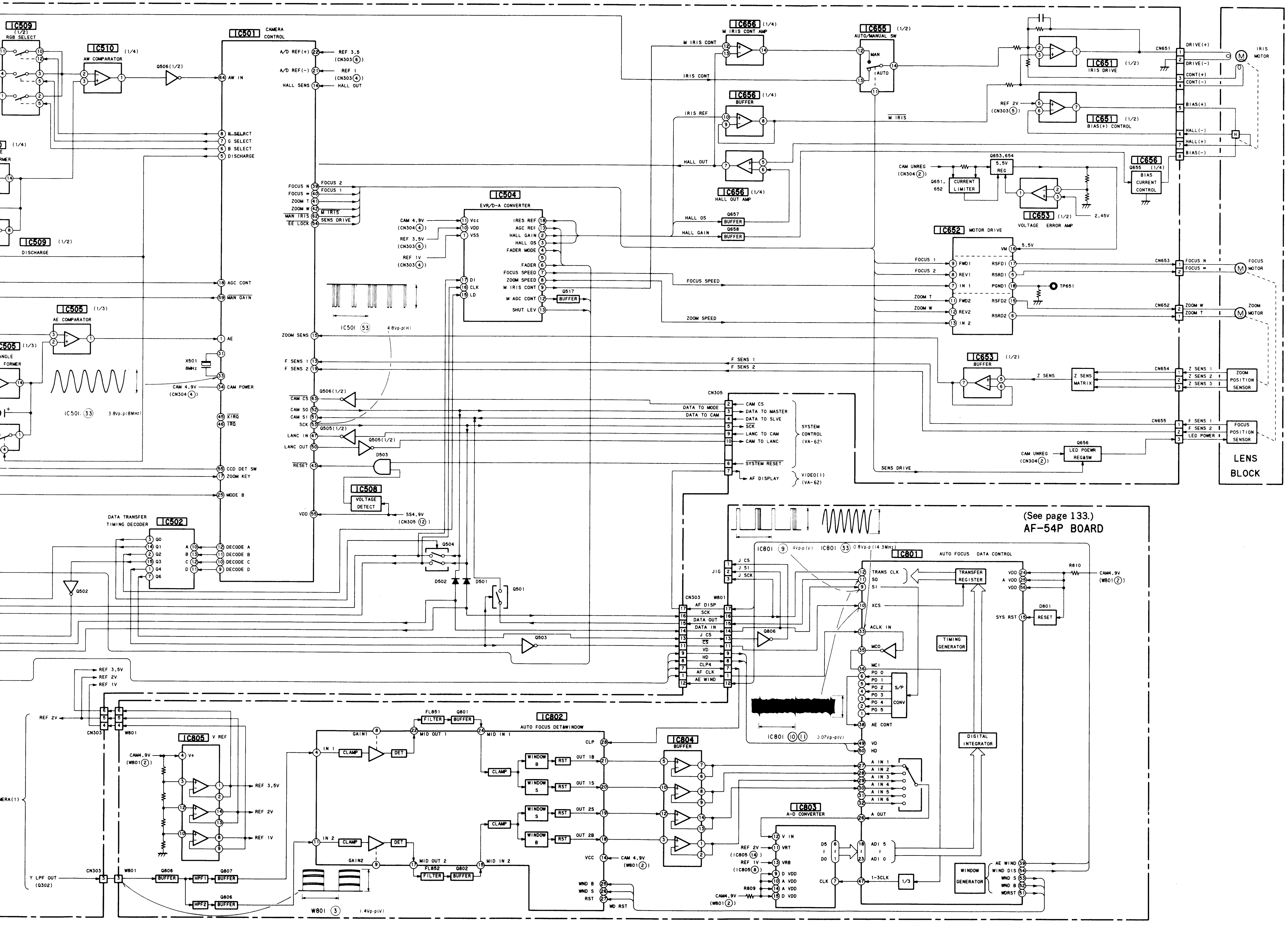
2. Pin Description

PIN No.	PIN Name	I/O	Function
1	AE	I	AE Integration-type A/D converter comparator input
2	NC	—	——
3	NC	—	——
4	NC	—	——
5	DISCHG	O	AWB. AE Integration-type A/D reset pulse
6	B SELECT	O	AWB Instrumentation line select pulse (blue)
7	G SELECT	O	AWB Instrumentation line select pulse (green)
8	R SELECT	O	AWB Instrumentation line select pulse (red)
9	DECODE D	O	Decode 4 to 10 and expand port with outside IC (4208)
10	DECODE C	O	Decode 4 to 10 and expand port with outside IC (4208)
11	DECODE B	O	Decode 4 to 10 and expand port with outside IC (4208)
12	DECODE A	O	Decode 4 to 10 and expand port with outside IC (4208)
13	F SENS1	I	Focus sensor 1 voltage entrance (Analog input)
14	HALL SENS	I	Hall element voltage input (Analog input)
15	ZOOM SENS	I	Zoom position detection voltage input (Analog input)
16	AN5	I	NC Not used
17	ZOOM KEY	I	Zoom switch voltage input (Analog input)
18	AGC CONT	I	AGC voltage input (Analog input)
19	F SENS2	I	Focus sensor 2 voltage input (Analog input)
20	AN7	I	NC Not used
21	A/D REF(−)	—	Built-in A/D converter the minimum standard voltage (Analog input)
22	A/D REF(+)	—	Built-in A/D converter the minimum standard voltage (Analog input)
23	V_{SS}	—	GND
24	V_{SS}	—	GND
25	MODE B	I	Pull up to SS4.9V
26	NC	—	——
27	MODA	I	Pull down to GND
28	STR A	—	NC Not used
29	E	—	NC Not used
30	STR B	—	NC Not used
31	EXTAL	O	Built-in inverter output for oscillating element
32	NC	—	——

PIN No.	PIN Name	I/O	Function
33	XTAL	I	Built-in inverter input for oscillating element
34	CAM POWER	I	Camera power source rise supervision
35	NC	—	——
36	PC1	—	NC
37	PC2	I	Pull up to SS4.9V
38	PC3	—	NC
39	FOCUS N	O	Focus motor N-direction rotating designation
40	FOCUS ∞	O	Focus motor ∞-direction rotating designation
41	ZOOM T	O	Zoom motor T-direction rotating designation
42	ZOOM W	O	Zoom motor W-direction rotating designation
43	$\overline{\text{RESET}}$	I	Reset
44	NC	—	——
45	$\overline{\text{XIRQ}}$	I	Pull up to SS4.9V
46	$\overline{\text{IRQ}}$	I	Pull up to SS4.9V
47	LANC IN	I	LANC input
48	NC	—	——
49	V_{SS}	—	GND
50	LANC OUT	O	LANC output
51	CAM SI	I	Serial data input
52	CAM SO	O	Serial data output
53	SCK	O	Serial clock
54	SENS DRIVE	O	AF sensor Luminous pulse output
55	V_{DD}	—	SS4.9V
56	PAI	—	NC
57	PA6	O	CCD DET switch select
58	OC3	—	NC
59	$\overline{\text{MAN GAIN}}$	O	AGC system automatic/manual select
60	NC	—	——
61	NC	—	——
62	$\overline{\text{MAN IRIS}}$	O	IRIS system automatic/manual select
63	$\overline{\text{CAMCS}}$	I	Camera chip select input
64	$\overline{\text{AW IN}}$	I	AWB Integration-type A/D converter comparator input

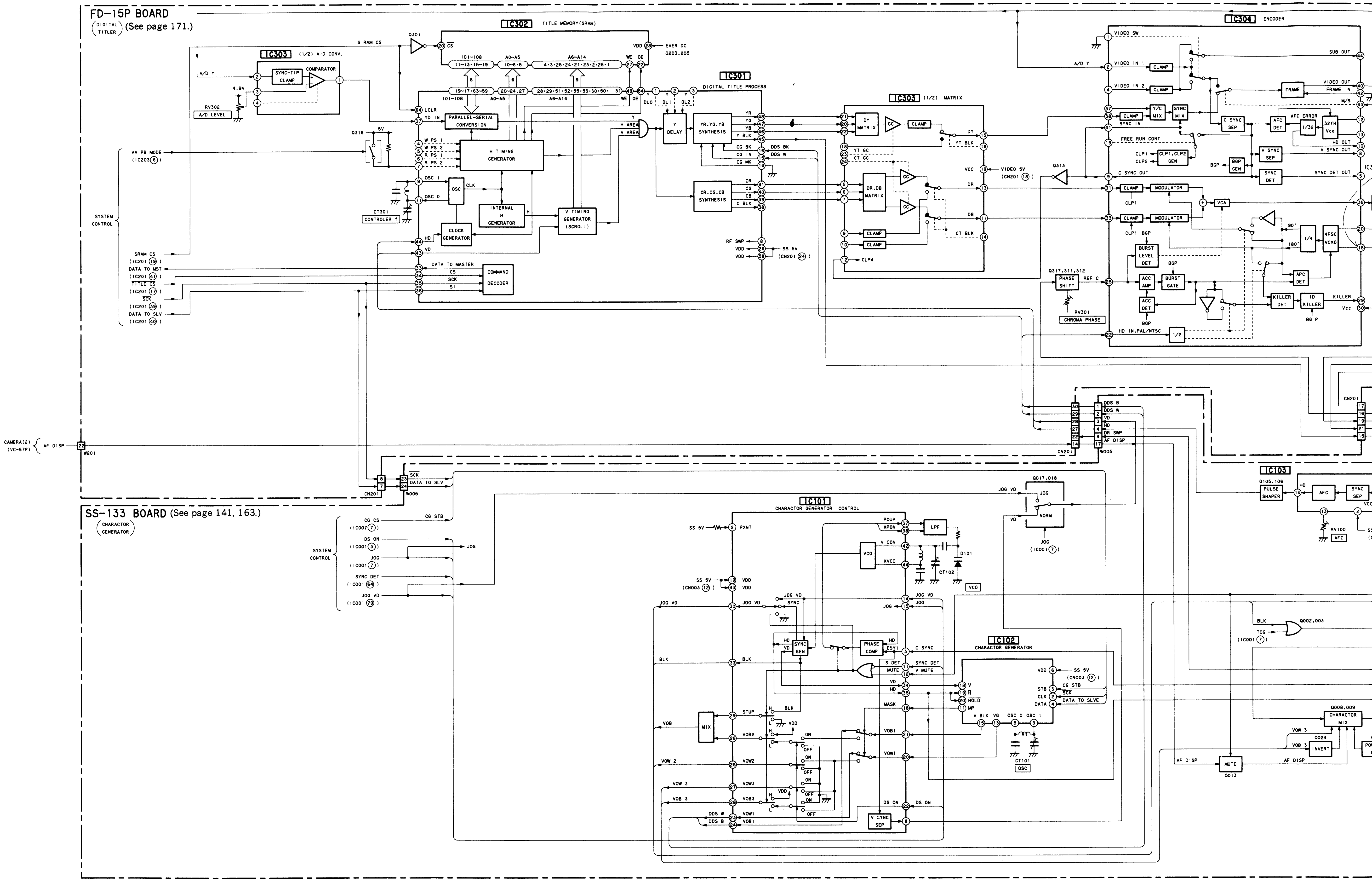
3-5. CAMERA (2) BLOCK DIAGRAM

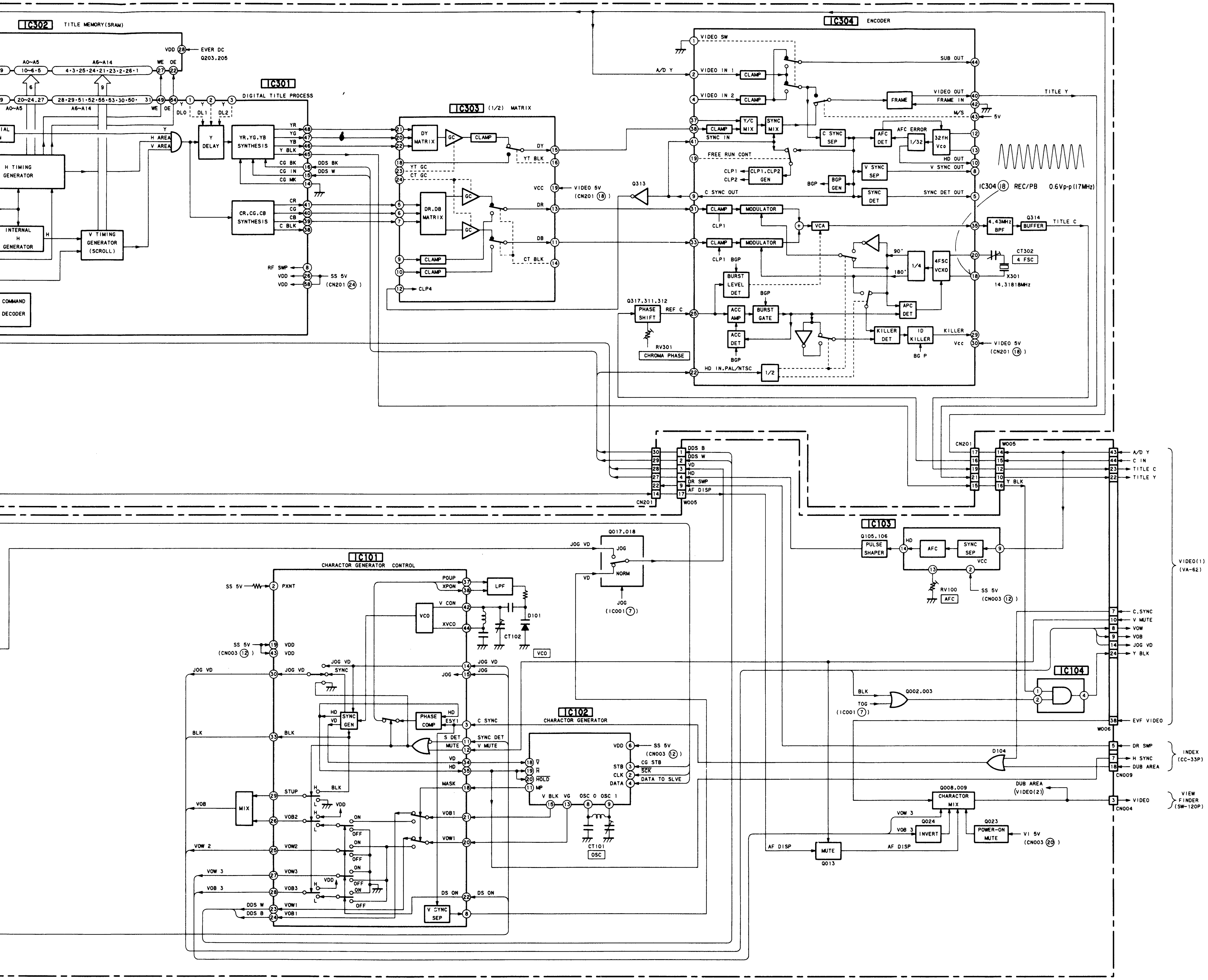

CAMERA(1) (CD-20P)
IRIS CONT
CN302
IC509 (1/2) RGB SELECT
Q507 BLANKING
Q509(1/2) BLANKING
INTEGRATOR
Q508 BLANKING DET
WB-R (MX-12 54)
WB-G (MX-12 55)
WB-B (MX-12 56)
WB-DC (MX-12 57)
IC510 (1/4) AW COMPARATOR
Q506(1/2)
IC501 CAMERA CONTROL
A/D REF(+)
A/D REF(-)
HALL SENS
REF 3.5 (CN303 6)
REF 1 (CN303 4)
HALL OUT
AW IN
R SELRCT
G SELECT
B SELECT
DISCHARGE
IC510 (1/4) BUFFER
IC510 (1/4) TRIANGLE WAVE FORMER
IC501 (1/4) CURRENT SOURCE
IC509 (1/2) DISCHARGE
CAMERA(1)
AGC CONT R (IC655 4)
M AGC
Q516
AGC CONT
MAN GAIN
IC505 (1/3) AE COMPARATOR
Q515 INTEGRATOR
AE
IC505 (1/3) TRIANGLE WAVE FORMER
IC505 (1/3) Q514 CURRENT SOURCE
IC507 DISCHARGE
IC501 33 3.8Vp-p(8MHz)
X501 8MHz
CAM 4.9V (CN304 4)
CAM POWER
XIRQ
TRQ
VG
CN301
CCD DET SW
CCD DET SW
ZOOM KEY
MODE B (CPA301 A3)
MODE B
DATA TRANSFER TIMING DECODER
IC502
DECODE A
DECODE B
DECODE C
DECODE D
FADER MODE
FADER
M AGC CONT
LD
EVR DATA
EVR CLK
Q502
AGC REF
SHUT LEV
STB
DATA
CK
VD
HD
CLP4
CL
AF CLK
FOCUS N
FOCUS W
ZOOM T
ZOOM W
MAN IRIS
EE LOCK
FOCUS 2
FOCUS 1
M IRIS
SENS DRIVE
IC504 EVR/D-A CONVERTER
CAM 4.9V (CN304 4)
REF 3.5V (CN303 6)
REF 1V (CN303 4)
Vcc
VDD
VSS
IRES REF
AGC REF
HALL GAIN
HALL OS
FADER MODE
FADER
FOCUS SPEED
ZOOM SPEED
M IRIS CONT
M AGC CONT
SHUT LEV
Q517 BUFFER
DI
CLK
LD
IC501 53 4.8Vp-p(H)
ZOOM SENS
F SENS 1
F SENS 2
CAM CS
CAM SO
CAM SI
SCK
LANC IN
LANC OUT
RESET
Q506(1/2)
Q505(1/2)
D503
IC508 VOLTAGE DETECT
S54.9V (CN305 12)
VDD
Q504
D502
D501
Q501
Q503
IC656 (1/4) M IRIS CONT AMP
M IRIS CONT
IRIS CONT
IC656 (1/4) BUFFER
IRIS REF
HALL OUT
IC656 (1/4) HALL OUT AMP
HALL OS
HALL GAIN
Q657 BUFFER
Q658 BUFFER
IC655 (1/2) AUTO/MANUAL SW
MAN
AUTO
M IRIS
FOCUS SPEED
ZOOM SPEED
F SENS 1
F SENS 2
CN305
DATA TO MODE
DATA TO CAM
CAM CS
DATA TO MASTER
DATA TO SLVE
SCK
LANC TO CAM
CAM TO LANC
SYSTEM CONTROL (VA-62)
SYSTEM RESET
AF DISPLAY
VIDEO(1) (VA-62)
SENS DRIVE
IC801 9 4Vp-p(V)
IC801 33 0.8Vp-p(14.3MHz)
JIG
J CS
J SI
J SCK
TRANS CLK
SO
SI
XCS
ACLK IN
MCO
MCI
PO 0
PO 1
PO 2
PO 3
PO 4
PO 5
S/P CONV
AE CONT
VD
HD
A IN 1
A IN 2
A IN 3
A IN 4
A IN 5
A IN 6
A OUT
CN303
W801
AF DISP
SCK
DATA OUT
DATA IN
J CS
CS
VD
HD
CLP4
AF CLK
AE WIND
Q806
IC801 10 11 3.07Vp-p(V)
REF 3.5V
REF 2V
REF 1V
REF 2V
IC805 V REF
CAM4.9V (W801 2)
V+
REF 3.5V
REF 2V
REF 1V
CAMERA(1)
IC802 AUTO FOCUS DET&WINDOW
FL851 FILTER
Q801 BUFFER
GAIN1
IN 1
CLAMP
DET
MID OUT 1
MID IN 1
CLP
WINDOW B
WINDOW S
RST
OUT 1B
OUT 1S
OUT 2S
OUT 2B
IN 2
GAIN2
MID OUT 2
FL852 FILTER
Q802 BUFFER
MID IN 2
VCC
CAM 4.9V (W801 2)
WND B
WND S
RST
WD RST
IC804 BUFFER
IC803 A-D CONVERTER
V IN
VRT
VRB
D VDD
A VDD
REF 2V (IC805 14)
REF 1V (IC805 8)
R809
CAM4.9V (W801 2)
D5
D0
CLK
ADI 5
ADI 0
1-3CLK
1/3
Y LPF OUT (Q302)
Q808 BUFFER
HPF1
Q807 BUFFER
HPF2
Q806 BUFFER
W801 3 1.4Vp-p(V)
ZOOM SW
WIDE
TELE
CN306
ZOOM C
ZOOM W
ZOOM T
REF 1V (CN303 4)
REF 3.5V (CN303 6)
VC-67P BOARD (1/2)
(See page 118.)



IC509 (1/2) RGB SELECT
IC510 (1/4) AW COMPARATOR
Q506(1/2)
IC501 CAMERA CONTROL
A/D REF(+)
A/D REF(−)
HALL SENS
REF 3.5 (CN303 ⑥)
REF 1 (CN303 ④)
HALL OUT
AW IN
R SELECT
G SELECT
B SELECT
DISCHARGE
IC509 (1/2) DISCHARGE
FOCUS N
FOCUS ∞
ZOOM T
ZOOM W
MAN IRIS
EE LOCK
FOCUS 2
FOCUS 1
M IRIS
SENS DRIVE
IC504 EVR/D-A CONVERTER
CAM 4.9V (CN304 ④)
REF 3.5V (CN303 ⑥)
REF 1V (CN303 ④)
Vcc
VDD
VSS
IRES REF
AGC REF
HALL GAIN
HALL OS
FADER MODE
FADER
FOCUS SPEED
ZOOM SPEED
M IRIS CONT
M AGC CONT
SHUT LEV
DI
CLK
LD
Q517 BUFFER
AGC CONT
MAN GAIN
IC505 (1/3) AE COMPARATOR
IC505 (1/3) ANGLE FORMER
AE
X501 8MHz
CAM POWER
CAM 4.9V (CN304 ④)
IC501 ㉝ 3.8Vp-p(8MHz)
IC501 (53) 4.8Vp-p(H)
ZOOM SENS
F SENS 1
F SENS 2
XIRQ
IRQ
CAM CS
CAM SO
CAM SI
SCK
LANC IN
LANC OUT
RESET
Q506(1/2)
Q505(1/2)
D503
IC508 VOLTAGE DETECT
VDD
SS4.9V (CN305 ⑫)
CCD DET SW
ZOOM KEY
MODE B
DATA TRANSFER TIMING DECODER
IC502
DECODE A
DECODE B
DECODE C
DECODE D
Q502
Q504
D502
D501
Q501
Q503
IC656 (1/4) M IRIS CONT AMP
M IRIS CONT
IRIS CONT
IC656 (1/4) BUFFER
IRIS REF
IC656 (1/4) HALL OUT AMP
HALL OUT
HALL OS
HALL GAIN
Q657 BUFFER
Q658 BUFFER
IC655 (1/2) AUTO/MANUAL SW
MAN
AUTO
IC651 (1/2) IRIS DRIVE
REF 2V (CN303 ⑤)
IC651 (1/2) BIAS(+) CONTROL
CN651
DRIVE(+)
DRIVE(−)
CONT(+)
CONT(−)
BIAS(+)
HALL(−)
HALL(+)
BIAS(−)
IRIS MOTOR
CAM UNREG (CN304 ②)
Q651, 652 CURRENT LIMITER
Q653,654 5.5V REG
IC653 (1/2) VOLTAGE ERROR AMP
2.45V
IC656 Q655 (1/4) BIAS CURRENT CONTROL
IC652 MOTOR DRIVE
VM
5.5V
FOCUS 1
FOCUS 2
ZOOM T
ZOOM W
FWD1
REV1
IN 1
FWD2
REV2
IN 2
RSFD1
RSRD1
PGND1
RSFD2
RSRD2
TP651
FOCUS SPEED
ZOOM SPEED
CN653
FOCUS N
FOCUS ∞
FOCUS MOTOR
CN652
ZOOM W
ZOOM T
ZOOM MOTOR
IC653 (1/2) BUFFER
Z SENS
Z SENS MATRIX
CN654
Z SENS 1
Z SENS 2
Z SENS 3
ZOOM POSITION SENSOR
CN655
F SENS 1
F SENS 2
LED POWER
FOCUS POSITION SENSOR
CAM UNREG (CN304 ②)
Q656 LED POWER REG&SW
SENS DRIVE
LENS BLOCK
CN305
DATA TO MODE
DATA TO CAM
CAM CS
DATA TO MASTER
DATA TO SLVE
SCK
LANC TO CAM
CAM TO LANC
SYSTEM CONTROL (VA-62)
SYSTEM RESET
AF DISPLAY
VIDEO(1) (VA-62)
(See page 133.)
AF-54P BOARD
IC801 ⑨ 4Vp-p(V)
IC801 ㉝ 0.8Vp-p(14.3MHz)
IC801 AUTO FOCUS DATA CONTROL
JIG
J CS
J SI
J SCK
CN303
W801
AF DISP
SCK
DATA OUT
DATA IN
J CS
CS
VD
HD
CLP4
AF CLK
AE WIND
Q806
TRANS CLK
SO
SI
XCS
ACLK IN
MCO
MCI
PO 0
PO 1
PO 2
PO 3
PO 4
PO 5
S/P CONV
AE CONT
TRANSFER REGISTER
TIMING GENERATOR
VDD
A VDD
VDD
R810
CAM4.9V (W801 ②)
SYS RST
D801 RESET
IC801 ⑩⑪ 3.07Vp-p(V)
VD
HD
A IN 1
A IN 2
A IN 3
A IN 4
A IN 5
A IN 6
A OUT
DIGITAL INTEGRATOR
REF 3.5V
REF 2V
REF 1V
REF 2V
CN303
W801
IC805 V REF
CAM4.9V (W801 ②)
V+
REF 3.5V
REF 2V
REF 1V
CAMERA(1)
Y LPF OUT (Q302)
FL851 FILTER
Q801 BUFFER
IC802 AUTO FOCUS DET&WINDOW
GAIN1
IN 1
CLAMP
DET
MID OUT 1
MID IN 1
CLP
CLAMP
WINDOW B
WINDOW S
RST
OUT 1B
OUT 1S
OUT 2S
OUT 2B
IN 2
GAIN2
MID OUT 2
MID IN 2
FL852 FILTER
Q802 BUFFER
VCC
CAM 4.9V (W801 ②)
WND B
WND S
RST
WD RST
Q808 BUFFER
HPF1
Q807 BUFFER
HPF2
Q806 BUFFER
W801 ③ 1.4Vp-p(V)
IC804 BUFFER
IC803 A-D CONVERTER
V IN
REF 2V (IC805 ⑭)
VRT
REF 1V (IC805 ⑧)
VRB
D VDD
A VDD
A VDD
D VDD
R809
CAM4.9V (W801 ②)
D5
D0
CLK
ADI 5
ADI 0
1-3CLK
1/3
WINDOW GENERATOR
AE WIND
WIND DIS
WND S
WND B
WDRST

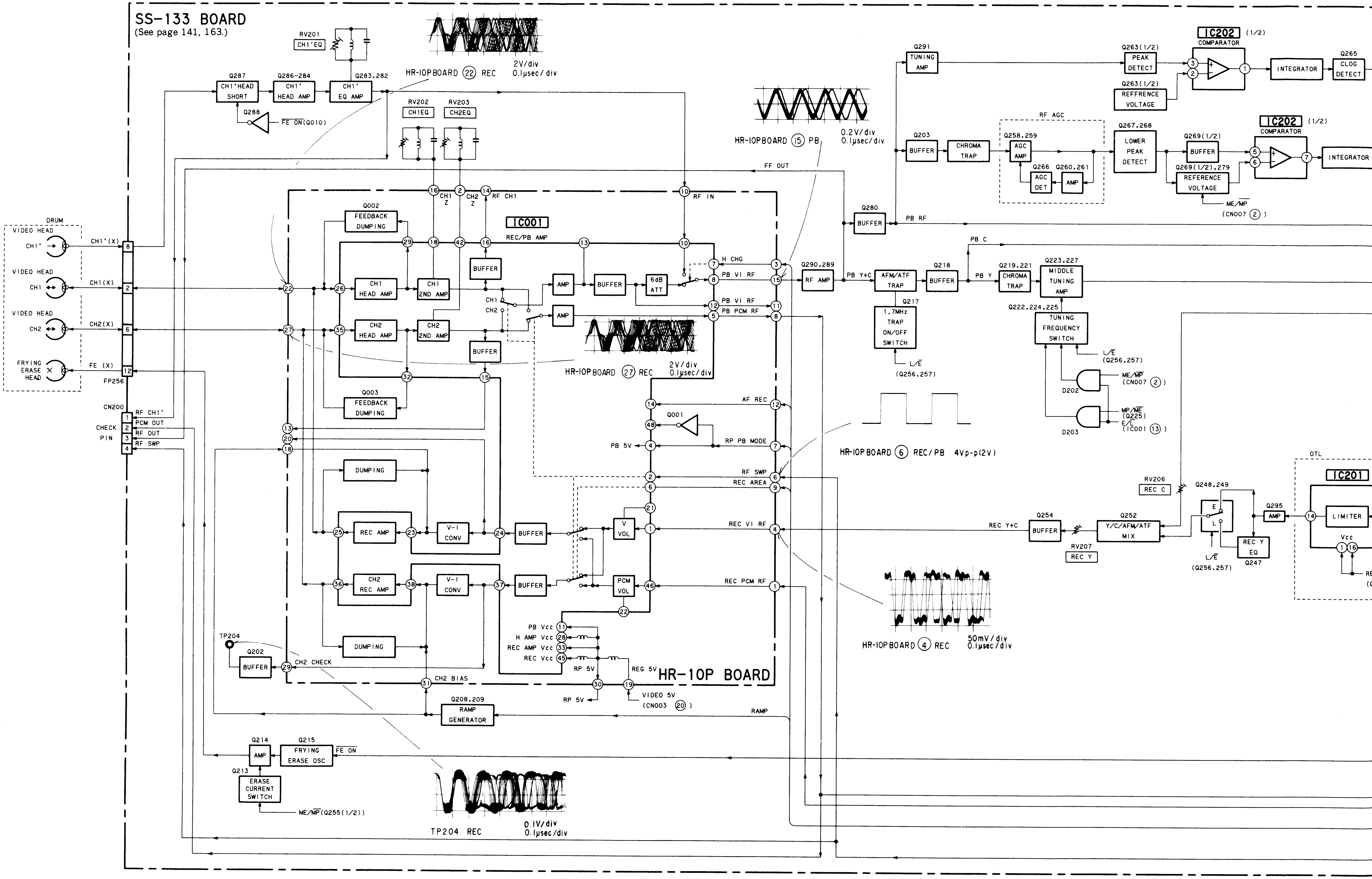
3-6. DIGITAL TITLER BLOCK DIAGRAM

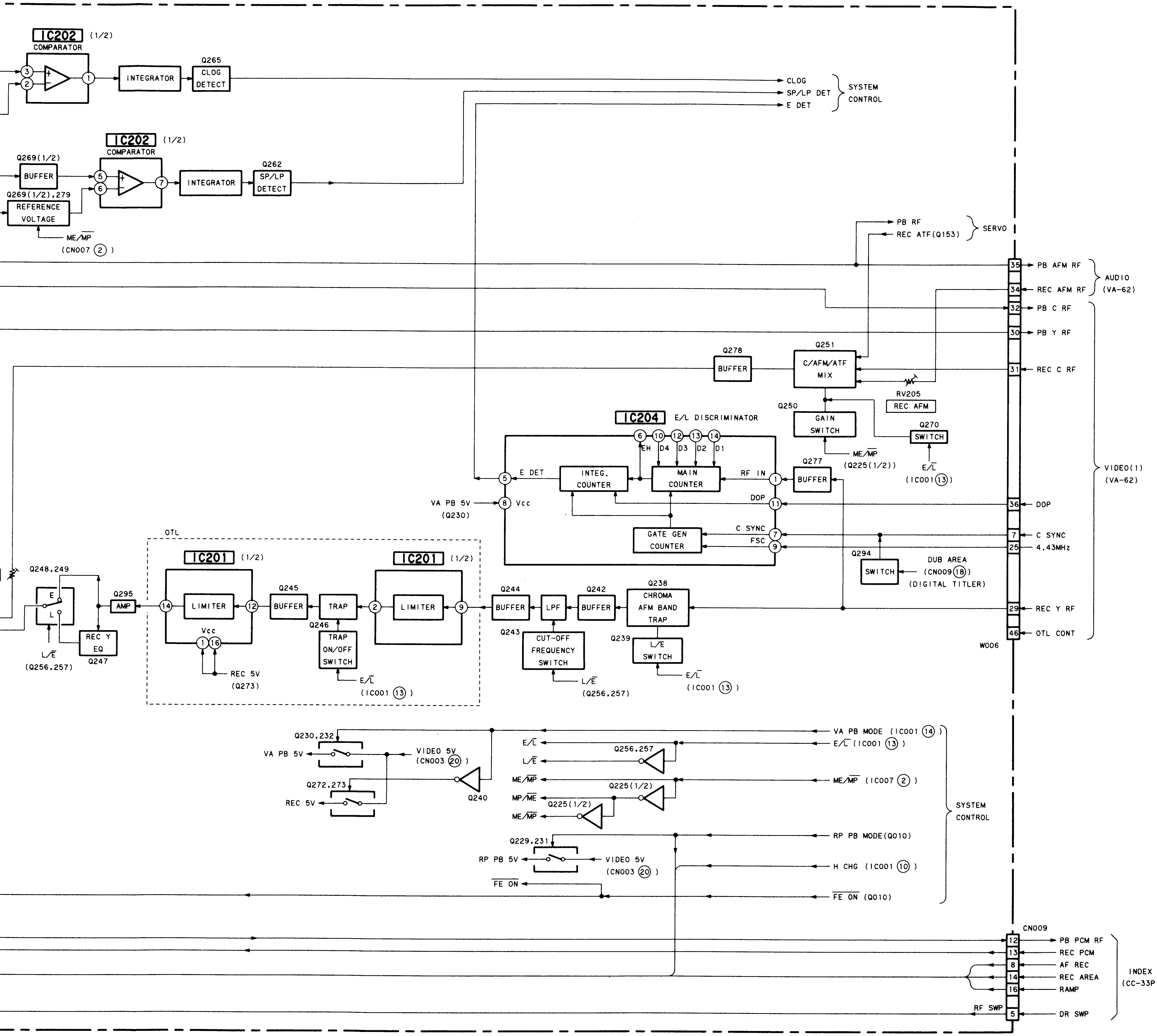

FD-15P BOARD
(DIGITAL TITLER) (See page 171.)
IC303 (1/2) A-D CONV.
SYNC-TIP CLAMP
COMPARATOR
RV302 A/D LEVEL
A/D Y
4.9V
S RAM CS
Q301
IC302 TITLE MEMORY(SRAM)
EVER DC
Q203,205
IC301 DIGITAL TITLE PROCESS
PARALLEL-SERIAL CONVERSION
H TIMING GENERATOR
OSC
CLK
INTERNAL H GENERATOR
V TIMING GENERATOR (SCROLL)
CLOCK GENERATOR
COMMAND DECODER
Y DELAY
YR.YG.YB SYNTHESIS
CR.CG.CB SYNTHESIS
IC303 (1/2) MATRIX
DY MATRIX
DR.DB MATRIX
CLAMP
YT BLK
CT BLK
CLP4
VIDEO 5V (CN201 ⑱)
Q313
IC304 ENCODER
VIDEO SW
VIDEO IN 1
VIDEO IN 2
SUB OUT
VIDEO OUT
FRAME IN
M/S
FRAME
Y/C MIX
SYNC MIX
SYNC IN
C SYNC SEP
AFC DET
AFC ERROR
1/32
32fH VCO
HD OUT
V SYNC OUT
FREE RUN CONT
CLP1,CLP2 GEN
V SYNC SEP
BGP GEN
C SYNC OUT
SYNC DET
SYNC DET OUT
MODULATOR
VCA
1/4
4FSC VCXO
BURST LEVEL DET
ACC AMP
ACC DET
BURST GATE
APC DET
KILLER DET
ID KILLER
KILLER
Q317,311,312
PHASE SHIFT
REF C
RV301 CHROMA PHASE
HD IN.PAL/NTSC
1/2
VA PB MODE (IC203⑥)
Q316
5V
CT301 CONTROLER f
SYSTEM CONTROL
SRAM CS (IC201 ⑲)
DATA TO MST (IC201 ㊶)
TITLE CS (IC201 ⑰)
SCK (IC201 ㊴)
DATA TO SLV (IC201 ㊵)
RF SWP
SS 5V (CN201 ㉔)
CAMERA(2) (VC-67P)
AF DISP
W201
CN201
W005
DDS B
DDS W
VD
HD
DR SWP
AF DISP
DATA TO SLV
SS-133 BOARD (See page 141, 163.)
(CHARACTOR GENERATOR)
CG CS (IC007⑦)
DS ON (IC001③)
JOG (IC001⑦)
SYNC DET (IC001 ㊹)
JOG VD (IC001 ㊾)
CG STB
Q017,018
JOG
NORM
IC101 CHARACTOR GENERATOR CONTROL
PXNT
POUP
XPON
LPF
V CON
VCO
XVCO
D101
CT102
SS 5V (CN003 ⑫)
VDD
JOG VD
SYNC
SYNC GEN
PHASE COMP
ESY1
C SYNC
S DET
MUTE
SYNC DET
V MUTE
BLK
STUP
MASK
MIX
VOB
VOB1
VOB2
VOW1
VOW 2
VOW 3
VOB 3
ON
OFF
DS ON
DDS W
DDS B
V SYNC SEP
IC102 CHARACTOR GENERATOR
HOLD
MP
V BLK
VG
OSC 0
OSC 1
CT101 OSC
CG STB
DATA TO SLVE
IC103
Q105,106 PULSE SHAPER
AFC
SYNC SEP
RV100 AFC
TOG (IC001⑦)
Q002,003
Q008,009 CHARACTOR MIX
Q024 INVERT
MUTE Q013



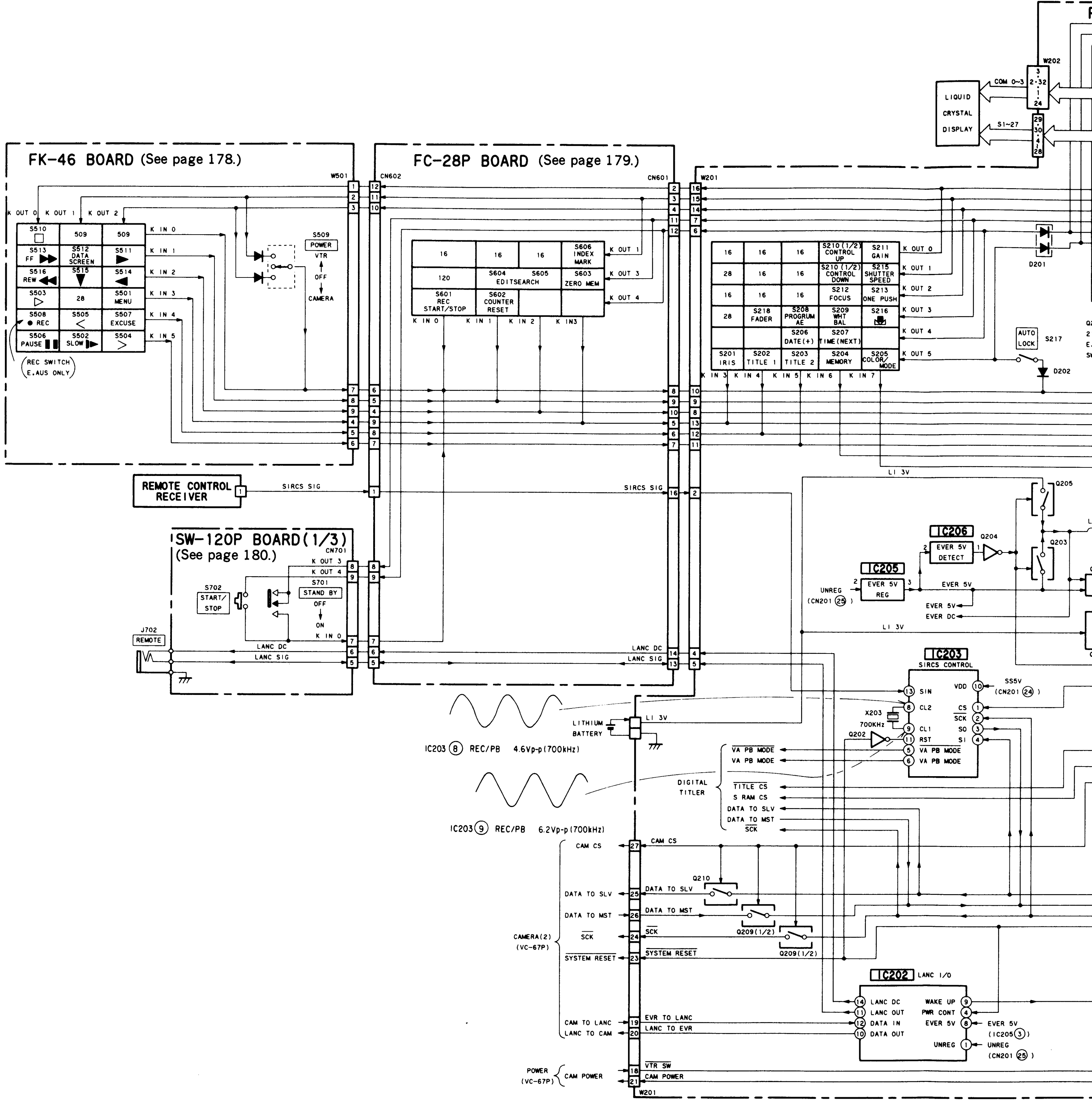
IC302 TITLE MEMORY(SRAM)
A0~A5
A6~A14
VDD
EVER DC
Q203,205
WE
OE
IC301
DIGITAL TITLE PROCESS
H TIMING GENERATOR
INTERNAL H GENERATOR
V TIMING GENERATOR (SCROLL)
COMMAND DECODER
Y DELAY
YR,YG,YB SYNTHESIS
CR,CG,CB SYNTHESIS
H AREA
V AREA
Y BLK
CG BK
CG IN
CG MK
C BLK
DDS BK
DDS W
RF SWP
SS 5V
(CN201 ㉔)
IC303 (1/2) MATRIX
DY MATRIX
DR.DB MATRIX
GC
CLAMP
YT GC
CT GC
YT BLK
CT BLK
CLP4
VIDEO 5V
(CN201 ⑱)
IC304 ENCODER
VIDEO SW
VIDEO IN 1
VIDEO IN 2
A/D Y
SYNC IN
Y/C MIX
SYNC MIX
C SYNC SEP
FREE RUN CONT
CLP1,CLP2 GEN
BGP GEN
V SYNC SEP
SYNC DET
C SYNC OUT
SUB OUT
VIDEO OUT
FRAME IN
FRAME
M/S
AFC DET
AFC ERROR
1/32
32fH Vco
HD OUT
V SYNC OUT
SYNC DET OUT
MODULATOR
VCA
1/4
4FSC VCXO
90°
180°
BURST LEVEL DET
ACC AMP
BURST GATE
ACC DET
APC DET
KILLER DET
ID KILLER
KILLER
HD IN.PAL/NTSC
1/2
Q313
Q317,311,312
PHASE SHIFT
REF C
RV301
CHROMA PHASE
IC304 ⑱ REC/PB 0.6Vp-p(17MHz)
4.43MHz BPF
Q314 BUFFER
TITLE Y
TITLE C
CT302
4 FSC
X301
14.31818MHz
CN201
W005
DDS B
DDS W
VD
HD
DR SWP
AF DISP
Y BLK
A/D Y
C IN
TITLE C
TITLE Y
IC103
Q105,106 PULSE SHAPER
AFC
SYNC SEP
RV100
AFC
SS 5V
(CN003 ⑫)
Q017,018
JOG VD
JOG
NORM
(IC001 ⑦)
IC101
CHARACTOR GENERATOR CONTROL
PXNT
POUP
XPON
LPF
VCO
V CON
XVCO
D101
CT102
VDD
JOG VD
SYNC
SYNC GEN
PHASE COMP
ESY1
C SYNC
S DET
MUTE
SYNC DET
V MUTE
BLK
STUP
MIX
VOB
VOB2
VOW 2
VOW 3
VOB 3
VOB1
VOW1
MASK
DS ON
DDS W
DDS B
V SYNC SEP
ON
OFF
IC102
CHARACTOR GENERATOR
SS 5V
(CN003 ⑫)
STB
CLK
DATA
CG STB
SCK
DATA TO SLVE
HOLD
MP
V BLK
VG
OSC 0
OSC 1
CT101
OSC
IC104
Q002,003
TOG
(IC001 ⑦)
D104
Q008,009 CHARACTOR MIX
Q024 INVERT
Q023 POWER-ON MUTE
V1 5V
(CN003 ⑳)
MUTE
Q013
DUB AREA (VIDEO(2))
C.SYNC
V MUTE
VOW
VOB
JOG VD
Y BLK
EVF VIDEO
W006
VIDEO(1) (VA-62)
DR SWP
H SYNC
DUB AREA
CN009
INDEX (CC-33P)
VIDEO
CN004
VIEW FINDER (SW-120P)

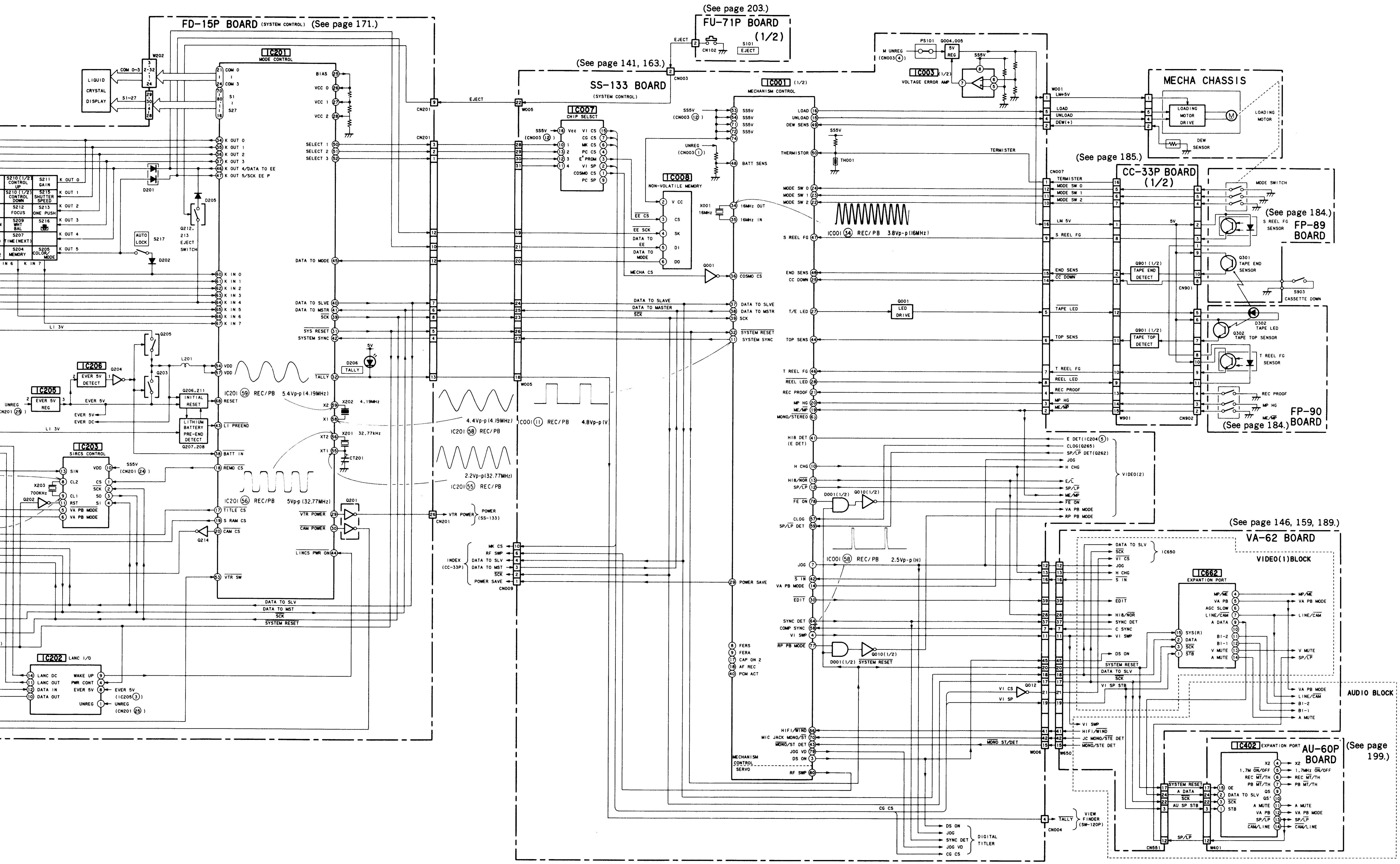
3-8. VIDEO (2) BLOCK DIAGRAM


SS-133 BOARD
(See page 141, 163.)
HR-10P BOARD
DRUM
VIDEO HEAD CH1'
VIDEO HEAD CH1
VIDEO HEAD CH2
FRYING ERASE HEAD
CH1'(X)
CH1(X)
CH2(X)
FE (X)
FP256
CN200
CHECK PIN
RF CH1'
PCM OUT
RF OUT
RF SWP
RV201 CH1'EQ
Q287 CH1'HEAD SHORT
Q286-284 CH1' HEAD AMP
Q283,282 CH1' EQ AMP
Q288
FE ON(Q010)
RV202 CH1EQ
RV203 CH2EQ
HR-10P BOARD (22) REC 2V/div 0.1μsec/div
IC001 REC/PB AMP
Q002 FEEDBACK DUMPING
Q003 FEEDBACK DUMPING
CH1 HEAD AMP
CH1 2ND AMP
CH2 HEAD AMP
CH2 2ND AMP
BUFFER
AMP
6dB ATT
CH1 Z
CH2 Z
RF CH1
RF IN
H CHG
PB VI RF
PB PCM RF
HR-10P BOARD (27) REC 2V/div 0.1μsec/div
AF REC
Q001
RP PB MODE
PB 5V
RF SWP
REC AREA
DUMPING
REC AMP
CH2 REC AMP
V-I CONV
V VOL
PCM VOL
REC VI RF
REC PCM RF
PB Vcc
H AMP Vcc
REC AMP Vcc
REC Vcc
RP 5V
REG 5V
VIDEO 5V (CN003 (20))
TP204
Q202 BUFFER
CH2 CHECK
CH2 BIAS
Q208,209 RAMP GENERATOR
RAMP
Q214 AMP
Q215 FRYING ERASE OSC
FE ON
Q213 ERASE CURRENT SWITCH
ME/MP(Q255(1/2))
TP204 REC 0.1V/div 0.1μsec/div
HR-10P BOARD (15) PB 0.2V/div 0.1μsec/div
FF OUT
Q280 BUFFER
PB RF
Q290,289 RF AMP
PB Y+C
AFM/ATF TRAP
Q217 1.7MHz TRAP ON/OFF SWITCH
L/E (Q256,257)
Q218 BUFFER
PB Y
PB C
Q219,221 CHROMA TRAP
Q223,227 MIDDLE TUNING AMP
Q222,224,225 TUNING FREQUENCY SWITCH
ME/MP (CN007 (2))
MP/ME (Q225)
E/L (IC001 (13))
D202
D203
Q291 TUNING AMP
Q203 BUFFER
CHROMA TRAP
RF AGC
Q258,259 AGC AMP
Q266 AGC DET
Q260,261 AMP
Q263(1/2) PEAK DETECT
Q263(1/2) REFFRENCE VOLTAGE
IC202 (1/2) COMPARATOR
INTEGRATOR
Q265 CLOG DETECT
Q267,268 LOWER PEAK DETECT
Q269(1/2) BUFFER
Q269(1/2),279 REFERENCE VOLTAGE
ME/MP (CN007 (2))
HR-10P BOARD (6) REC/PB 4Vp-p(2V)
HR-10P BOARD (4) REC 50mV/div 0.1μsec/div
REC Y+C
Q254 BUFFER
RV207 REC Y
Q252 Y/C/AFM/ATF MIX
RV206 REC C
Q248,249
Q247 REC Y EQ
Q295 AMP
OTL
IC201
LIMITER
Vcc

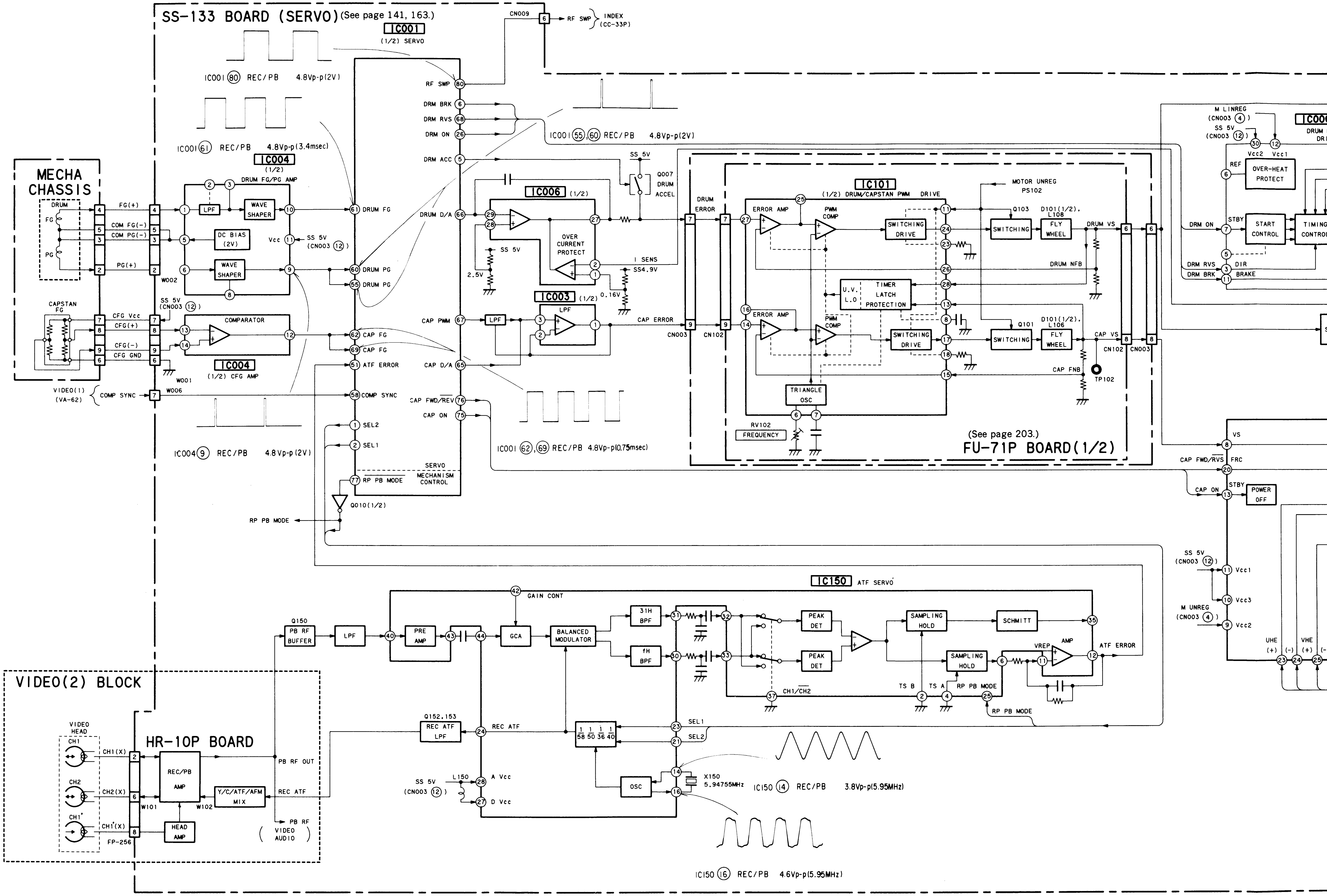

IC202 (1/2)
COMPARATOR
INTEGRATOR
Q265
CLOG DETECT
CLOG
SP/LP DET
E DET
SYSTEM CONTROL
IC202 (1/2)
COMPARATOR
Q269(1/2)
BUFFER
Q269(1/2),279
REFERENCE VOLTAGE
ME/MP (CN007 ②)
INTEGRATOR
Q262
SP/LP DETECT
PB RF
REC ATF(Q153)
SERVO
PB AFM RF
REC AFM RF
AUDIO (VA-62)
PB C RF
PB Y RF
REC C RF
Q278
BUFFER
Q251
C/AFM/ATF MIX
RV205
REC AFM
Q250
GAIN SWITCH
ME/MP (Q225(1/2))
Q270
SWITCH
E/L (IC001 ⑬)
IC204 E/L DISCRIMINATOR
EH D4 D3 D2 D1
E DET
INTEG. COUNTER
MAIN COUNTER
RF IN
Q277
BUFFER
VA PB 5V (Q230)
Vcc
DOP
GATE GEN COUNTER
C SYNC
FSC
DOP
C SYNC
4.43MHz
VIDEO(1) (VA-62)
Q294
SWITCH
DUB AREA (CN009 ⑱) (DIGITAL TITLER)
OTL
IC201 (1/2)
LIMITER
Vcc
REC 5V (Q273)
Q245
BUFFER
TRAP
Q246
TRAP ON/OFF SWITCH
E/L (IC001 ⑬)
IC201 (1/2)
LIMITER
Q244
BUFFER
LPF
Q242
BUFFER
Q243
CUT-OFF FREQUENCY SWITCH
L/E (Q256,257)
Q238
CHROMA AFM BAND TRAP
Q239
L/E SWITCH
E/L (IC001 ⑬)
REC Y RF
OTL CONT
W006
Q248,249
E L
L/E (Q256,257)
Q295
AMP
REC Y EQ
Q247
Q230,232
VA PB 5V
VIDEO 5V (CN003 ⑳)
Q272,273
REC 5V
Q240
VA PB MODE (IC001 ⑭)
E/L
E/L (IC001 ⑬)
Q256,257
L/E
ME/MP
ME/MP (IC007 ②)
Q225(1/2)
MP/ME
Q225(1/2)
ME/MP
SYSTEM CONTROL
Q229,231
RP PB 5V
VIDEO 5V (CN003 ⑳)
RP PB MODE(Q010)
H CHG (IC001 ⑩)
FE ON
FE ON (Q010)
CN009
PB PCM RF
REC PCM
AF REC
REC AREA
RAMP
RF SWP
DR SWP
INDEX (CC-33P)
35 34 32 30 31 36 7 25 29 46
12 13 8 14 16 5

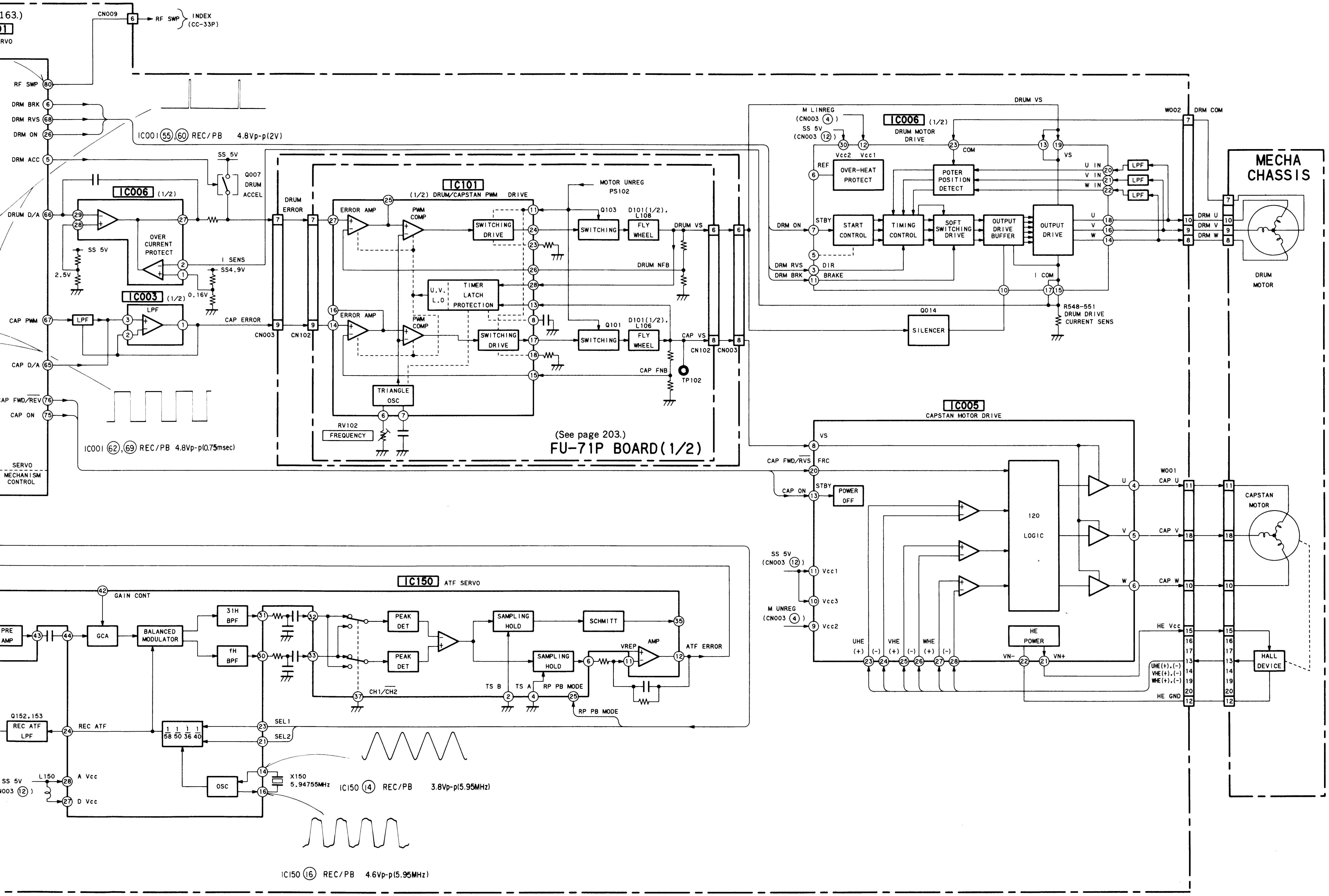
3-9. SYSTEM CONTROL BLOCK DIAGRAM


FK-46 BOARD (See page 178.)
FC-28P BOARD (See page 179.)
SW-120P BOARD (1/3) (See page 180.)
REMOTE CONTROL RECEIVER
LIQUID CRYSTAL DISPLAY
W501
CN602
CN601
W201
W202
CN701
COM 0-3
S1-27
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4
K OUT 5
K IN 0
K IN 1
K IN 2
K IN 3
K IN 4
K IN 5
S510
S513 FF
S516 REW
S503
S508 ● REC
S506 PAUSE
S512 DATA SCREEN
S515
S505
S502 SLOW
S511
S514
S501 MENU
S507 EXCUSE
S504
S509 POWER VTR OFF CAMERA
REC SWITCH (E.AUS ONLY)
S606 INDEX MARK
S604 EDITSEARCH
S605
S603 ZERO MEM
S601 REC START/STOP
S602 COUNTER RESET
S210 (1/2) CONTROL UP
S210 (1/2) CONTROL DOWN
S211 GAIN
S215 SHUTTER SPEED
S212 FOCUS
S213 ONE PUSH
S218 FADER
S208 PROGRUM AE
S209 WHT BAL
S216
S206 DATE (+)
S207 TIME (NEXT)
S201 IRIS
S202 TITLE 1
S203 TITLE 2
S204 MEMORY
S205 COLOR/MODE
AUTO LOCK
S217
D201
D202
SIRCS SIG
S702 START/STOP
S701 STAND BY OFF ON
J702 REMOTE
LANC DC
LANC SIG
LI 3V
Q205
Q204
Q203
IC206 EVER 5V DETECT
IC205 EVER 5V REG
UNREG (CN201 ㉕)
EVER 5V
EVER DC
IC203 SIRCS CONTROL
SIN
CL2
CL1
RST
VA PB MODE
VDD
CS
SCK
SO
SI
S5.5V (CN201 ㉔)
X203 700KHz
Q202
LITHIUM BATTERY
IC203 ⑧ REC/PB 4.6Vp-p (700kHz)
IC203 ⑨ REC/PB 6.2Vp-p (700kHz)
DIGITAL TITLER
TITLE CS
S RAM CS
DATA TO SLV
DATA TO MST
SCK
CAMERA (2) (VC-67P)
CAM CS
SYSTEM RESET
Q210
Q209 (1/2)
IC202 LANC I/O
LANC OUT
DATA IN
DATA OUT
WAKE UP
PWR CONT
UNREG
EVER 5V (IC205 ③)
UNREG (CN201 ㉕)
CAM TO LANC
LANC TO CAM
EVR TO LANC
LANC TO EVR
POWER (VC-67P)
CAM POWER
VTR SW


FD-15P BOARD (SYSTEM CONTROL) (See page 171.)
IC201 MODE CONTROL
LIQUID CRYSTAL DISPLAY
IC206 EVER 5V DETECT
IC205 EVER 5V REG
IC203 SIRCS CONTROL
IC202 LANC I/O
LITHIUM BATTERY PRE-END DETECT Q207,208
INITIAL RESET Q206,211
IC201 (59) REC/PB 5.4Vp-p(4.19MHz)
IC201 (56) REC/PB 5Vp-p(32.77MHz)
4.4Vp-p(4.19MHz) IC201 (58) REC/PB
2.2Vp-p(32.77MHz) IC201 (55) REC/PB
IC001 (11) REC/PB 4.8Vp-p(V)
(See page 203.)
FU-71P BOARD (1/2)
S101 EJECT
(See page 141, 163.)
SS-133 BOARD (SYSTEM CONTROL)
IC007 CHIP SELSCT
IC008 NON-VOLATILE MEMORY
IC001 (1/2) MECHANISM CONTROL
IC001 (34) REC/PB 3.8Vp-p(16MHz)
IC001 (58) REC/PB 2.5Vp-p(H)
IC003 (1/2) VOLTAGE ERROR AMP
MECHANISM CONTROL SERVO
VIEW FINDER (SW-120P)
DIGITAL TITLER
MECHA CHASSIS
LOADING MOTOR DRIVE
LOADING MOTOR
DEW SENSOR
(See page 185.)
CC-33P BOARD (1/2)
TAPE END DETECT
TAPE TOP DETECT
(See page 184.) FP-89 BOARD
S REEL FG SENSOR
TAPE END SENSOR
S903 CASSETTE DOWN
TAPE LED
TAPE TOP SENSOR
T REEL FG SENSOR
MODE SWITCH
REC PROOF
(See page 184.) FP-90 BOARD
VIDEO(2)
(See page 146, 159, 189.)
VA-62 BOARD
VIDEO(1)BLOCK
IC662 EXPANTION PORT
IC650
AUDIO BLOCK
IC402 EXPANTION PORT
AU-60P BOARD
(See page 199.)

3-10. SERVO BLOCK DIAGRAM


SS-133 BOARD (SERVO) (See page 141, 163.)
IC001 (1/2) SERVO
IC001 ⑧⓪ REC/PB 4.8Vp-p(2V)
IC001 ⑥① REC/PB 4.8Vp-p(3.4msec)
IC001 ⑤⑤,⑥⓪ REC/PB 4.8Vp-p(2V)
IC001 ⑥②,⑥⑨ REC/PB 4.8Vp-p(0.75msec)
IC004 ⑨ REC/PB 4.8Vp-p(2V)
IC004 (1/2) DRUM FG/PG AMP
IC004 (1/2) CFG AMP
MECHA CHASSIS
DRUM
FG
PG
CAPSTAN FG
FG(+)
COM FG(−)
COM PG(−)
PG(+)
CFG Vcc
CFG(+)
CFG(−)
CFG GND
W002
W001
W006
LPF
WAVE SHAPER
DC BIAS (2V)
COMPARATOR
Vcc
SS 5V (CN003 ⑫)
VIDEO(1) (VA-62)
COMP SYNC
RF SWP
DRM BRK
DRM RVS
DRM ON
DRM ACC
DRUM D/A
DRUM FG
DRUM PG
CAP FG
ATF ERROR
COMP SYNC
CAP PWM
CAP D/A
CAP FWD/REV
CAP ON
SEL2
SEL1
RP PB MODE
SERVO MECHANISM CONTROL
Q010(1/2)
CN009
RF SWP
INDEX (CC-33P)
SS 5V
Q007 DRUM ACCEL
IC006 (1/2)
OVER CURRENT PROTECT
2.5V
I SENS
SS4.9V
0.16V
IC003 (1/2)
CAP ERROR
DRUM ERROR
CN003
CN102
IC101 (1/2) DRUM/CAPSTAN PWM DRIVE
ERROR AMP
PWM COMP
SWITCHING DRIVE
MOTOR UNREG PS102
Q103
D101(1/2), L108
SWITCHING
FLY WHEEL
DRUM VS
DRUM NFB
U.V. L.O
TIMER LATCH PROTECTION
Q101
D101(1/2), L106
CAP VS
CAP FNB
TP102
TRIANGLE OSC
RV102 FREQUENCY
(See page 203.)
FU-71P BOARD(1/2)
M LINREG (CN003 ④)
SS 5V (CN003 ⑫)
IC00
DRUM DRI
Vcc2
Vcc1
REF
OVER-HEAT PROTECT
STBY
START CONTROL
TIMING CONTROL
DRM ON
DRM RVS
DRM BRK
DIR
BRAKE
VS
CAP FWD/RVS
FRC
CAP ON
STBY
POWER OFF
SS 5V (CN003 ⑫)
Vcc1
Vcc3
M UNREG (CN003 ④)
Vcc2
UHE (+) (−)
VHE (+) (−)
IC150 ATF SERVO
GAIN CONT
Q150 PB RF BUFFER
LPF
PRE AMP
GCA
BALANCED MODULATOR
31H BPF
fH BPF
PEAK DET
SAMPLING HOLD
SCHMITT
VREP
AMP
ATF ERROR
CH1/CH2
TS B
TS A
RP PB MODE
SEL1
SEL2
Q152,153 REC ATF LPF
REC ATF
58 50 36 40
OSC
X150 5.94755MHz
SS 5V (CN003 ⑫)
L150
A Vcc
D Vcc
IC150 ⑭ REC/PB 3.8Vp-p(5.95MHz)
IC150 ⑯ REC/PB 4.6Vp-p(5.95MHz)
VIDEO(2) BLOCK
VIDEO HEAD
CH1
CH2
CH1'
CH1(X)
CH2(X)
CH1'(X)
HR-10P BOARD
REC/PB AMP
HEAD AMP
Y/C/ATF/AFM MIX
W101
W102
FP-256
PB RF OUT
REC ATF
PB RF (VIDEO AUDIO)


163.)
RVO
CN009
RF SWP
INDEX
(CC-33P)
RF SWP 80
DRM BRK 6
DRM RVS 68
DRM ON 26
IC001 55, 60 REC/PB 4.8Vp-p(2V)
DRM ACC 5
SS 5V
Q007
DRUM
ACCEL
IC006 (1/2)
DRUM D/A 66
OVER CURRENT PROTECT
SS 5V
2.5V
I SENS
SS4.9V
0.16V
IC003 (1/2)
LPF
CAP PWM 67
CAP ERROR
CAP D/A 65
CAP FWD/REV 76
CAP ON 75
IC001 62, 69 REC/PB 4.8Vp-p(0.75msec)
SERVO
MECHANISM CONTROL
DRUM ERROR
CN003
CN102
IC101
(1/2) DRUM/CAPSTAN PWM DRIVE
ERROR AMP
PWM COMP
SWITCHING DRIVE
MOTOR UNREG
PS102
Q103
SWITCHING
D101(1/2), L108
FLY WHEEL
DRUM VS
DRUM NFB
U.V. L.O
TIMER LATCH PROTECTION
Q101
D101(1/2), L106
CAP VS
CAP FNB
TP102
TRIANGLE OSC
RV102
FREQUENCY
(See page 203.)
FU-71P BOARD(1/2)
DRUM VS
M LINREG
(CN003 4)
SS 5V
(CN003 12)
IC006 (1/2)
DRUM MOTOR DRIVE
Vcc2 Vcc1
COM
VS
REF
OVER-HEAT PROTECT
POTER POSITION DETECT
U IN
V IN
W IN
LPF
DRM ON
STBY
START CONTROL
TIMING CONTROL
SOFT SWITCHING DRIVE
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
DRM RVS
DIR
DRM BRK
BRAKE
I COM
Q014
SILENCER
R548-551
DRUM DRIVE CURRENT SENS
W002
DRM COM
DRM U
DRM V
DRM W
MECHA CHASSIS
DRUM MOTOR
IC005
CAPSTAN MOTOR DRIVE
VS
CAP FWD/RVS
FRC
CAP ON
STBY
POWER OFF
120 LOGIC
SS 5V
(CN003 12)
Vcc1
Vcc3
M UNREG
(CN003 4)
Vcc2
HE POWER
UHE (+) (-)
VHE (+) (-)
WHE (+) (-)
VN-
VN+
W001
CAP U
CAP V
CAP W
HE Vcc
UHE(+),(-)
VHE(+),(-)
WHE(+),(-)
HE GND
CAPSTAN MOTOR
HALL DEVICE
IC150
ATF SERVO
GAIN CONT
PRE AMP
GCA
BALANCED MODULATOR
31H BPF
fH BPF
PEAK DET
SAMPLING HOLD
SCHMITT
VREP
AMP
ATF ERROR
CH1/CH2
TS B
TS A
RP PB MODE
Q152,153
REC ATF LPF
REC ATF
SEL1
SEL2
58 50 36 40
OSC
X150
5.94755MHz
IC150 14 REC/PB 3.8Vp-p(5.95MHz)
SS 5V
L150
A Vcc
D Vcc
IC150 16 REC/PB 4.6Vp-p(5.95MHz)

3-11. SERVO, SYSTEM CONTROL SYSTEM TERMINAL FUNCTION SS-133 BOARD IC001 (CXP-80116)

PIN No.	Signal Name	I/O	Function	Connection
1	SEL2	O	ATF REF PILOT signal frequency control ATF REF PILOT f_1 f_2 f_3 f_4 SEL 1 H L H L SEL 2 H H L L	ATF IC CXA1204Q
2	SEL1	O		
3	DS ON	O	Data Screen ON/OFF control. Data Screen On and Data Screen key are selected with "H"	VIDEO block
4	VI SWP	O	RF SWP using for Vidoe system Normally, same as RF SWP. When using 'CH only "H" 3Head is used.	VIDEO block
5	DRM ACC	O	DRUM motor acceleration signal Acceleration is selected with "H"	To Drum motor driver CXA8006M
6	DRM BLK	O	DRUM motor brake signal Brake is selected with "H"	To Drum motor driver CXA8006M
7	JOG	O	Normal/JOG mode recognition signal JOG is selected with "H"	R/P Amp VIDEO block
8	FE RA	—	Not used	——
9	FE RS	—		
10	H CHG	O	2CH or 'CH select signal 'CH is selected with "H" Only 3Head is used	VIDEO system R/P Amp
11	SYSTEM SYNC	O	Internal bus communication synchronizing signal (V synchronization)	Mode controller
12	SP/$\overline{\text{LP}}$	O	SP/LP mode recognition signal SP mode is selected with "H"	R/P Amp VIDEO/AUDIO block
13	$\overline{\text{NOR}}$/Hi8	O	Hi8/NOR mode output	VIDEO block
14	VA PB MODE	O	VIDEO/AUDIO system REC/PB mode select PB mode is selected with "H"	VIDEO/AUDIO block
15	UNLOAD	O	Loading motor control signal OFF LOADING UNLOADING BRAKE LOAD L H L H UNLOAD L L H H	TO loading motor
16	LOAD	O		
17	CAP ON2	—	Not used	——
18	AF REC	—	Not used	——
19	ME/$\overline{\text{MP}}$	I	ME/MP tape recognition input ME tape is selected with "H"	To CC board
20	MP HG	I	MP HG tape recognition input MPHG is selected with "L"	To CC board
21	REC PROOF	I	REC PROOF recognition input REC PROOF is selected with "L"	To CC board
22	MODE SW2	I	Mechanical position input	To CC board
23	MODE SW1	I		
24	MODE SW0	I		
25	$\overline{\text{CC DOWN}}$	I	Cassette IN switch input Cassette IN is selected with "L"	To CC board
26	DRM ON	O	Drum motor drive control Motor Drive is selected with "H"	To Drum motor driver CXA8006M
27	T/E LED	O	LED for tape top end sensor drive control LED Flashing is selected with "H"	To CC board
28	$\overline{\text{REEL LED}}$	O	LED for reel sensor drive control LED Flashing is selected with "L"	To CC board

PIN No.	Signal Name	I/O	Function	Connection
29	POWER SAVE	O	Marker block POWER SAVE control signal	——
30	$\overline{\text{EDIT}}$	O	EDIT ON/OFF control EDIT is selected with "L"and interlocked with EDIT key.	To VIDEO block
31	SS GND	—	—	——
32	$\overline{\text{SYSTEM}}$ $\overline{\text{RESET}}$	I	Control by mode controller with RESET terminal of this microcomputer RESET is selected "L"	Mode controller and others
33	SS GND	—	—	——
34	16M OUT	O	Crystal connecting terminal for system clock oscillation (16 MHz)	X'tal (X001)
35	16M IN	I		
36	$\overline{\text{COSMO CS}}$	I	Select signal of this microcomputer from internal bus communication mode controller Selected with "L"	Mode controller
37	DATA TO SLVE	I	Serial data input terminal	Mode controller
38	DATA TO MSTR	O	Serial data output terminal	Mode controller
39	$\overline{\text{SCK}}$	I	Serial clock input terminal	Mode controller
40	PCM ACT	—	Not used	——
41	Hi8 DET	I	Hi8 with Hi8/NOR distinction input "H" when playing back	IC204 (CXA2017)
42	S IN	I	Distinction input of the S terminal connection	VIDEO block
43	$\overline{\text{MONO}}$/ST DET	I	AFM monaural/stereo recognition input Stereo is selected "H" (Only stereo correspondence model)	To AUDIO block
44	TOP SENS	I	Tape top end sensor input TOP is selected with "H"	To CC board
45	END SENS	I	END is selected with "H"	
46	· T REEL FG	I	Reel sensor input Take up side	To CC board
47	S REEL FG	I	Reel sensor input Supply side	
48	BATT SENS	I	Battery input voltage sense	——
49	DEW SENS	I	DEW SENSOR input	DEW SENSOR, To CC board
50	THERMISTOR	I	THERMISTOR input (This model : fixed value)	
51	ATF ERROR	I	ATF error (ATF LOCK error) input, A/D input terminal	IC105 (CXA1204Q)⑫
52	SS GND	—	—	——
53 54	SS 4.9V		Power source supply terminal	
55	DRM PG	I	DRUM PG input, FRC (high precision timer) capture input terminal	IC502 ⑨
56	$\overline{\text{HiFi}}$/WIND	I	Not used	——
57	CLOG	I	Clog detection signal input. CLOG is selected with "H"	Q265 Ⓒ
58	COMP SYNC	I	Composite trunk (composite synchronizing signal) input. (built-in V SYNC separator)	To V IDEO block
59	SP/$\overline{\text{LP}}$ DET	I	SP/LP recognition signal input	Q262 Ⓒ
60	DRM PG	—	—	——
61	DRM FG	I	DRUM FG input terminal, FRC capture input terminal	IC004 ⑩ Sense Amplifier

PIN No.	Signal Name	I/O	Function	Connection
62	CAP FG	I	CAPSTAN FG input terminal, FRC capture input terminal	IC502⑫ Sense amplifier
63	MONO/$\overline{ST}$	O	Input-output selecting switch control signal	VIDEO block
64	SYNC DET	I	With/Without VIDEO signal recognition signal input	To VIDEO block
65	CAP D/A	O	DA gate pulse output terminal for CAP ERROR output, Servo exclusive output terminal (DA mode)	To capstan lowpass filter
66	DRM D/A	O	DA gate pulse output terminal for DRUM ERROR output, Servo exclusive output terminal (DA mode)	To drum lowpass filter
67	CAP PWM	O	PWM output terminal for CAP ERROR output, Servo excluseive output terminal (PWM mode)	Capstan driver IC503
68	DRM RVS	O	DRUM rotating direction control signal RVS is selected with "H" FWD is selected with "L"	IC006 ③
69	CAP FG	I	External event input terminal to CAP FG input terminal exclusive counter for TAPE COUNTER drive	IC004⑫ sense amplifier
70	MIC JACK MONO/$\overline{ST}$	I	External MIC Monaural/stereo recognition signal. Monaural is selected with "H"	To AUDIO block
71 72	SS 4.9V			
73	SS GND	—	—	——
74	—	—	Not used	——
75	CAP ON	O	Capstan driver ON control signal	IC005⑬ Capstan driver
76	CAP FWD/$\overline{REV}$	O	Capstan rotaing direction control signal, FWD is selected with "H", RVS is selected with "L"	IC005⑳ Capstan driver
77	$\overline{\text{RP PB MODE}}$	O	REC/PB mode select signal of RP amplifier and ATF IC	Q010 Ⓑ
78	FE ON	O	Flying erase oscillation ON/OFF signal. Oscillation is selected with "H"	To RP AMP.
79	JOG VD	O	Artificial VD output terminal input to VIDEO signal in varying speed playback	To VIDEO block
80	RF SWP	O	RF SWP output temrinal	RP block VIDEO/AUDIO block

Decoder port for the chip cell allocation list (TC4028)

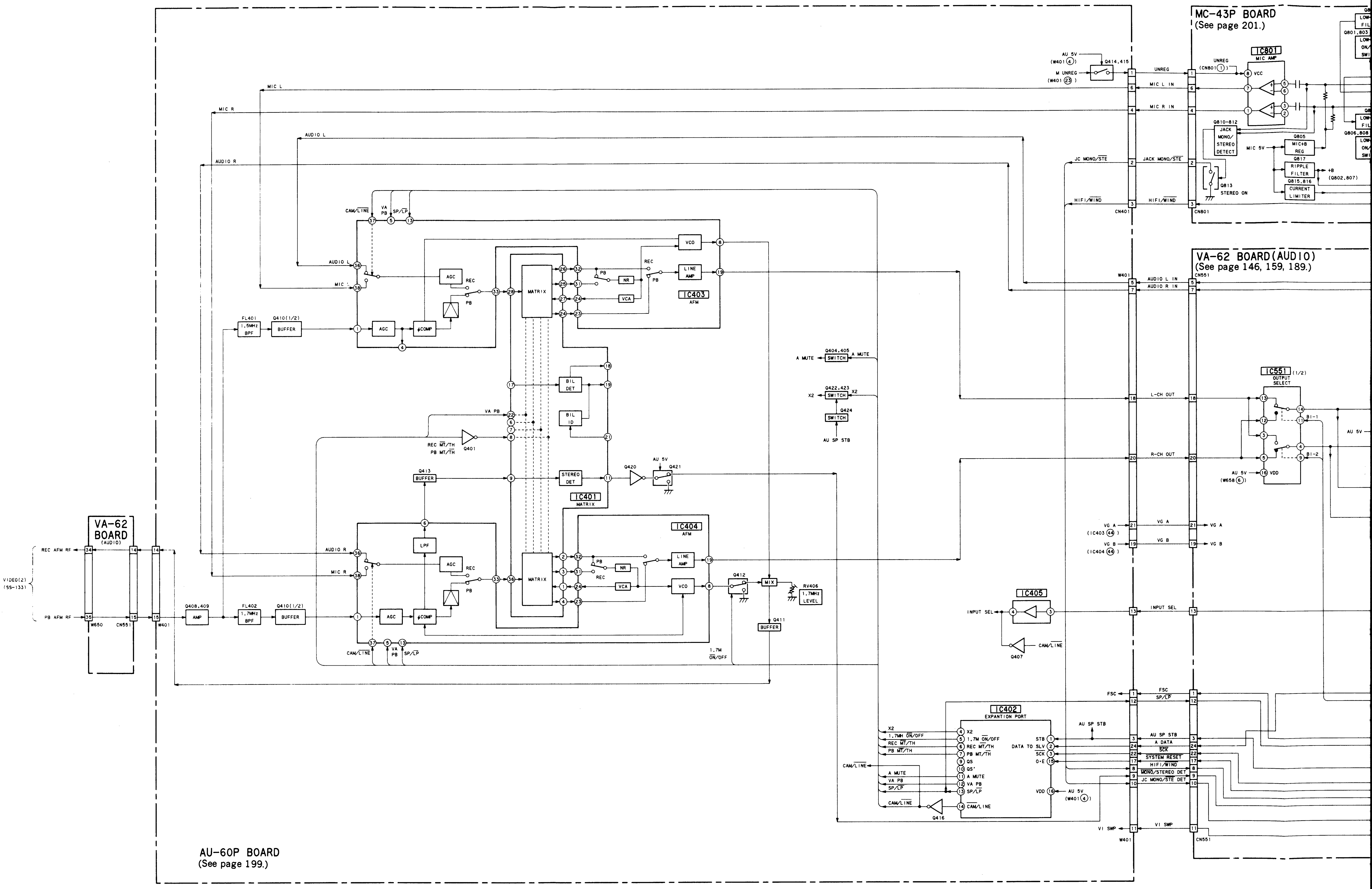
No.	Port name	Port allocation name
3	Q0	E^2-ROM CS
14	Q1	
2	Q2	VA S/P STB
15	Q3	Φ II SR CS
1	Q4	COSMO CS
6	Q5	MARKER CS
7	Q6	CG STB
4	Q7	PCM CS
9	Q8	PCM S/P STB
5	Q9	—

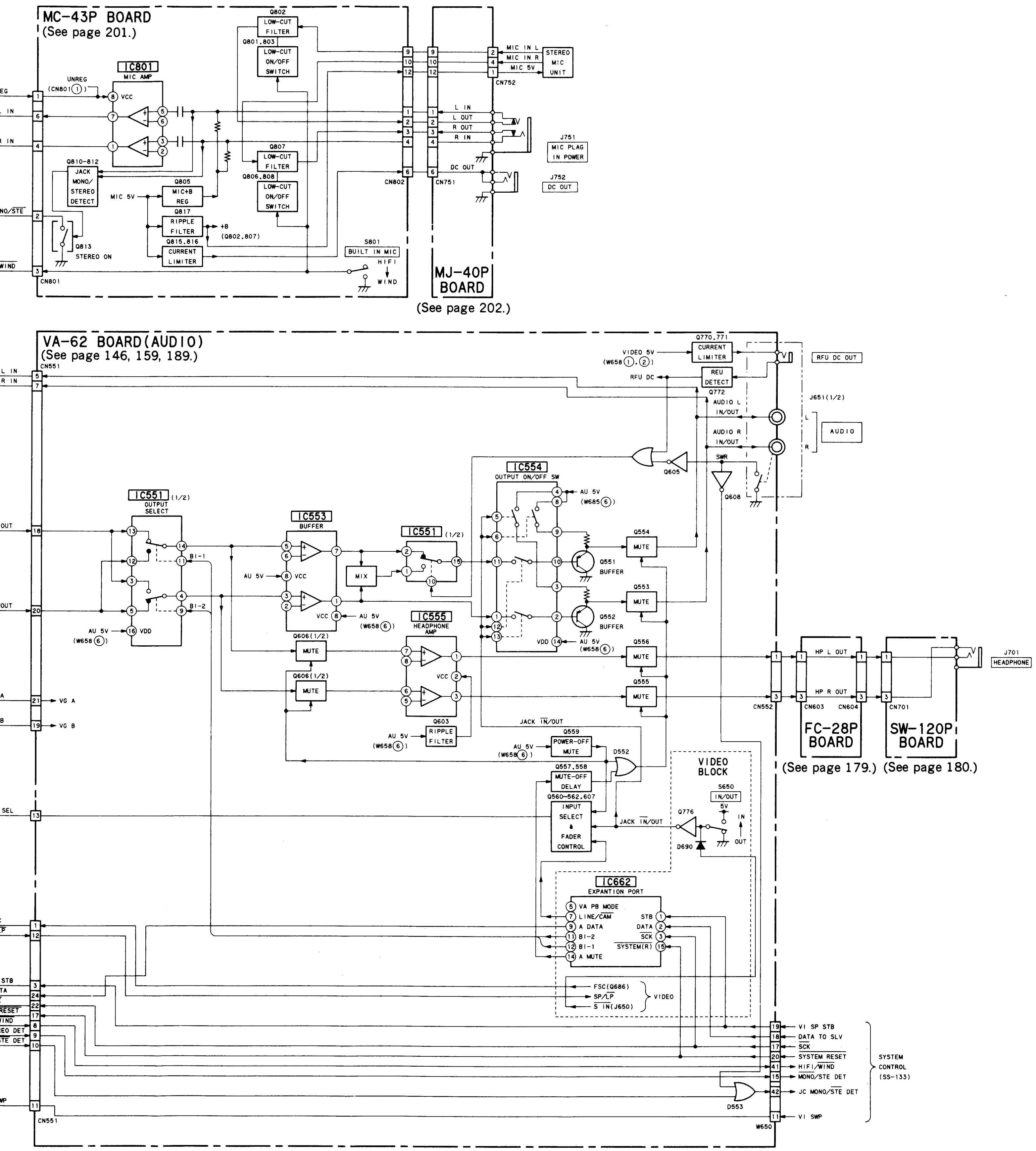
3-12. MODE CONTROL SYSTEM TERMINAL FUNCTION FD-15P BOARD IC201 (μPD75312)

Pin No.	Port name	Port allocation name	I/O	The another connection	Function•Remarks
1	S12		O	LCD	Segment signal output terminal of the liquid crystal display element (LCD)
2	S13		O	LCD	
3	S14		O	LCD	
4	S15		O	LCD	
5	S16		O	LCD	
6	S17		O	LCD	
7	S18		O	LCD	
8	S19		O	LCD	
9	S20		O	LCD	
10	S21		O	LCD	
11	S22		O	LCD	
12	S23		O	LCD	
13	S24/BP0		O	LCD	
14	S25/BP1		O	LCD	
15	S26/BP2		O	LCD	
16	S27/BP3		O	LCD	
17	S28/BP4	TITL CS	O	FD	Chip selector signal of the standard cell for titler (IC301)
18	S29/BP5	~REMO CS	O	FD	Chip selector signal of the wireless remote control reception microcomputer (IC203)
19	S30/BP6	S RAM CS	O	FD	Chip selector signal of RAM for the titler (IC302)
20	S31/BP7	~CAM CS	O	CAM	Chip selector signal of the camera microcomputer (IC501)
21	COM0			LCD	Remote control signal output terminal of the liquid crystal display element (LCD)
22	COM1			LCD	
23	COM2			LCD	
24	COM3			LCD	
25	BIAS			LCD	Output terminal for dividing resistance cut of the liquid crystal display element (LCD)
26	VLC0			LCD	Power source supply terminal of the liquid crystal display enement (LCD)
27	VLC1			LCD	
28	VLC2			LCD	
29	P40	~VTR POWER	O	FU	Turning ON/OFF signal of the VTR system DC/DC converter
30	P41	~CAM POWER	O	CAM	Turning ON/OFF signal of the CAM system DC/DC converter
31	P42	~SYSTEM RESET	O	ALL	Initializing (reset) signal of each microcomputer or IC
32	P43	~TALLY	O	VF	Tally LED flashing signal
33	VSS				Ground power source
34	P50	K OUT 0	O	FD	Output signal of the key matrix
35	P51	K OUT 1	O	FD	
36	P52	K OUT 2	O	FD	
37	P53	K OUT 3	O	FD	
38	P00/INT4	~BATT IN	I	FD	Signal for the battery or the AC adapter attaching/removing detection

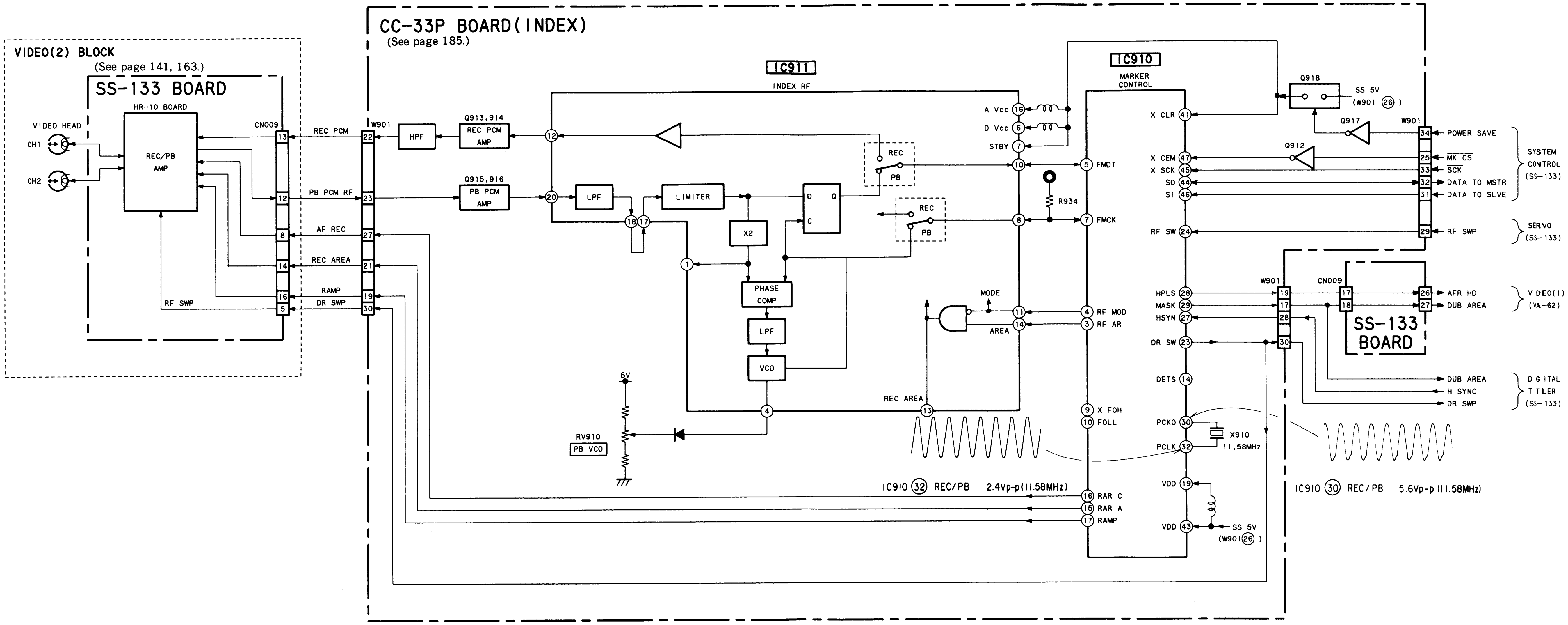
Pin No.	Port name	Port allocation name	I/O	The another connection	Function•Remarks
39	P01/~SCK	~SCK	O/I	ALL	Serial clock for serial communication (This is input only when communicating with camera microcomputer)
40	P02/S0/SB0	DATA TO SLVE	O	ALL	Data output signal for serial communication
41	P03/SI/SB1	DATA TO MSTR	I	ALL	Data input signal for serial communication
42	P10/INT0	SYSTEM SYNC	I	SS	Timing signal for serial communication
43	P11/INT1	~LI PRE END	I	FD	Pre-end detection signal of the lithium battery (Set value is 2.8V or less)
44	P12/INT2	~LINCS PWR ON	I	FD	POWER ON requiring signal of the LANC communication (Power is turned on with L at 140ms or more)
45	P13/TI0	DATA TO MODE	I	SS	Serial communication data input signal of EE-PROM
46	P20/PT00	K OUT4/DATA TO E^2	O	SS	Data output signal of the output signal +EE-PROM of the key matrix
47	P21	K OUT5/~SCK E^2	O	SS	Serial clock signal of the output signal +EE-PROM of the key matrix
48	P22/PCL	K OUT 6	O	FD	Output signal of the key matrix
49	P23/BUZ				
50	P30/LCDCL	SELECT 1	O	SS	Signal for producing chip select
51	P31/SYNC	SELECT 2	O	SS	
52	P32	SELECT 3	O	SS	
53	P33	~VTR SW	I	FD	Forced VTR mode signal (Uned at the place for business)
54	VDD				Positive voltage supplying terminal
55	XT1				Crystal vibrator connecting terminal for clock
56	XT2				
57	NC				
58	X1				Ceramic connecting terminal for the main system clock oscillation
59	X2				
60	P60/KR0	K IN 0	I	FD	Key matrix input signal
61	P61/KR1	K IN 1	I	FD	
62	P62/KR2	K IN 2	I	FD	
63	P63/KR3	K IN 3	I	FD	
64	P70/KR4	K IN 4	I	FD	
65	P71/KR5	K IN 5	I	FD	
66	P72/KR6	K IN 6	I	FD	
67	P73/KR7	K IN 7	I	FD	
68	~RESET	~RESET	I	FD	Reset signal input terminal
69	S0		O	FD	Output 1/64 of the oscillation for clock (32.768kHz/64≒512Hz)
70	S1		O	LCD	
71	S2		O	LCD	
72	S3		O	LCD	
73	S4		O	LCD	
74	S5		O	LCD	
75	S6		O	LCD	
76	S7		O	LCD	
77	S8		O	LCD	
78	S9		O	LCD	
79	S10		O	LCD	
80	S11		O	LCD	

3-13. AUDIO BLOCK DIAGRAM

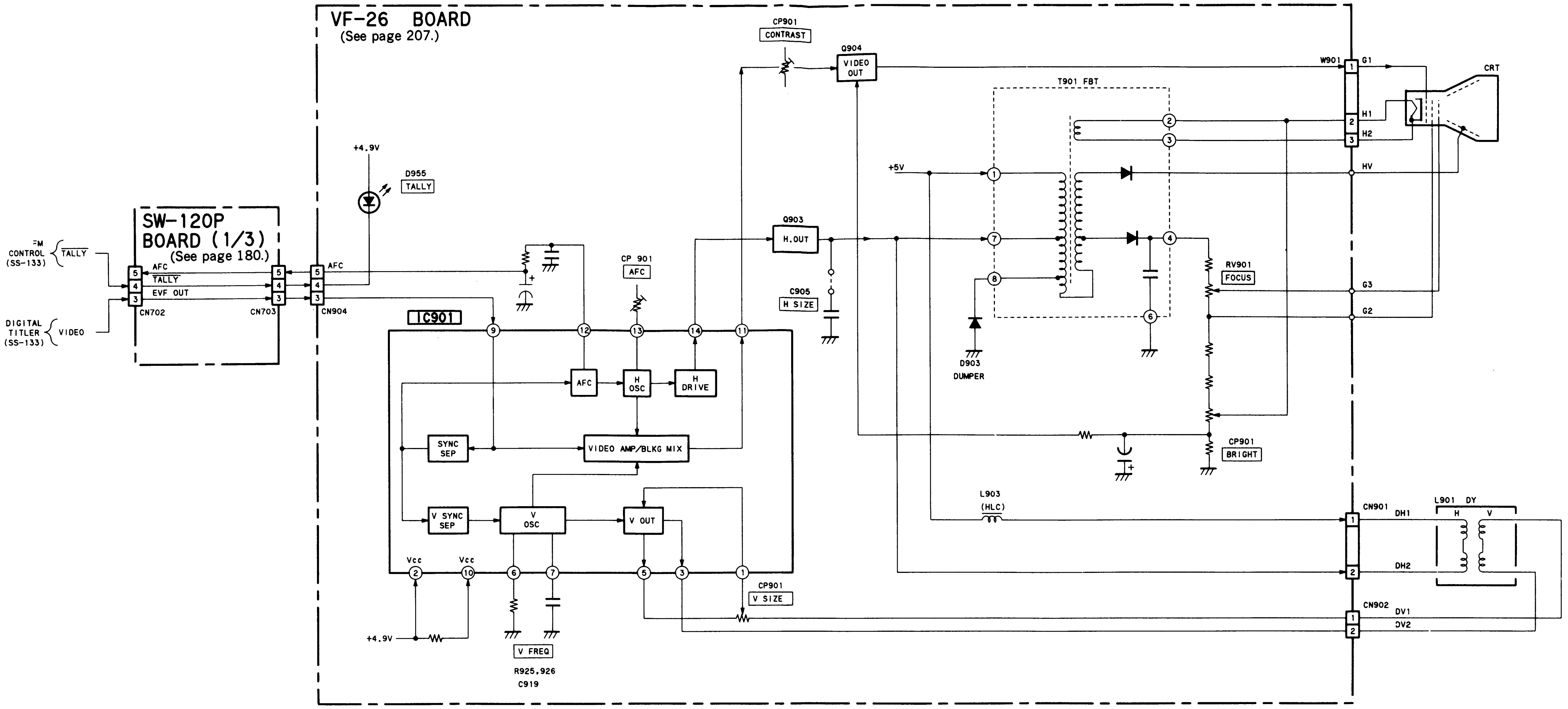

AU-60P BOARD
(See page 199.)
MC-43P BOARD
(See page 201.)
VA-62 BOARD(AUDIO)
(See page 146, 159, 189.)
VA-62 BOARD (AUDIO)
VIDEO(2) (SS-1331)
REC AFM RF
PB AFM RF
W650
CN551
W401
CN401
CN801
MIC L
MIC R
AUDIO L
AUDIO R
AU 5V
(W401 ④)
M UNREG
(W401 ㉓)
Q414,415
UNREG
MIC L IN
MIC R IN
JC MONO/STE
JACK MONO/STE
HIFI/WIND
IC801
MIC AMP
(CN801 ①)
VCC
Q810-812
JACK MONO/STEREO DETECT
Q805
MIC+B REG
MIC 5V
Q817
RIPPLE FILTER
+B (Q802,807)
Q815,816
CURRENT LIMITER
Q813
STEREO ON
Q801,803
Q806,808
LOW FIL
ON/ SWI
CAM/LINE
VA PB
SP/LP
AGC
REC
PB
φCOMP
FL401
1.5MHz BPF
Q410(1/2)
BUFFER
MATRIX
NR
VCA
VCO
LINE AMP
IC403
AFM
BIL DET
BIL ID
REC MT/TH
PB MT/TH
Q401
Q413
BUFFER
STEREO DET
IC401
MATRIX
Q420
Q421
AU 5V
LPF
IC404
AFM
Q408,409
AMP
FL402
1.7MHz BPF
Q412
MIX
RV406
1.7MHz LEVEL
Q411
BUFFER
1.7M ON/OFF
A MUTE
Q404,405
SWITCH
X2
Q422,423
SWITCH
Q424
SWITCH
AU SP STB
W401
AUDIO L IN
AUDIO R IN
L-CH OUT
R-CH OUT
IC551 (1/2)
OUTPUT SELECT
BI-1
BI-2
AU 5V
(W658 ⑥)
VDD
VG A
(IC403 ㊹)
VG B
(IC404 ㊹)
IC405
INPUT SEL
Q407
CAM/LINE
FSC
SP/LP
IC402
EXPANTION PORT
X2
1.7MH ON/OFF
REC MT/TH
PB MT/TH
QS
QS'
A MUTE
VA PB
SP/LP
CAM/LINE
Q416
STB
DATA TO SLV
SCK
O·E
VDD
AU 5V (W401 ④)
AU SP STB
A DATA
SCK
SYSTEM RESET
HIFI/WIND
MONO/STEREO DET
JC MONO/STE DET
V1 SWP
CN551


MC-43P BOARD
(See page 201.)
IC801
MIC AMP
UNREG
(CN801①)
VCC
Q802
LOW-CUT FILTER
Q801,803
LOW-CUT ON/OFF SWITCH
Q807
LOW-CUT FILTER
Q806,808
LOW-CUT ON/OFF SWITCH
Q810-812
JACK MONO/STEREO DETECT
Q805
MIC+B REG
MIC 5V
Q817
RIPPLE FILTER
+B (Q802,807)
Q815,816
CURRENT LIMITER
Q813
STEREO ON
S801
BUILT IN MIC
HIFI
WIND
CN801
CN802
CN751
CN752
MIC IN L
MIC IN R
MIC 5V
STEREO MIC UNIT
L IN
L OUT
R OUT
R IN
DC OUT
J751
MIC PLAG IN POWER
J752
DC OUT
MJ-40P BOARD
(See page 202.)
VA-62 BOARD(AUDIO)
(See page 146, 159, 189.)
CN551
L IN
R IN
OUT
OUT
VG A
VG B
SEL
STB
RESET
WIND
MP
IC551 (1/2)
OUTPUT SELECT
AU 5V
(W658⑥)
VDD
BI-1
BI-2
IC553
BUFFER
VCC
MIX
IC551 (1/2)
IC554
OUTPUT ON/OFF SW
AU 5V
(W685⑥)
Q551
BUFFER
Q552
BUFFER
VDD
Q554
MUTE
Q553
MUTE
Q556
MUTE
Q555
MUTE
IC555
HEADPHONE AMP
Q606(1/2)
MUTE
Q603
RIPPLE FILTER
JACK IN/OUT
Q559
POWER-OFF MUTE
D552
Q557,558
MUTE-OFF DELAY
Q560-562,607
INPUT SELECT & FADER CONTROL
JACK IN/OUT
VIDEO BLOCK
S650
IN/OUT
5V
IN
OUT
Q776
D690
IC662
EXPANTION PORT
VA PB MODE
LINE/CAM
A DATA
BI-2
BI-1
A MUTE
STB
DATA
SCK
SYSTEM(R)
FSC(Q686)
SP/LP
S IN(J650)
VIDEO
VIDEO 5V
(W658①,②)
Q770,771
CURRENT LIMITER
RFU DC
REU DETECT
Q772
RFU DC OUT
AUDIO L IN/OUT
AUDIO R IN/OUT
J651(1/2)
AUDIO
Q605
SWR
Q608
CN552
HP L OUT
HP R OUT
CN603
CN604
CN701
FC-28P BOARD
(See page 179.)
SW-120P BOARD
(See page 180.)
J701
HEADPHONE
VI SP STB
DATA TO SLV
SCK
SYSTEM RESET
HIFI/WIND
MONO/STE DET
JC MONO/STE DET
VI SWP
D553
W650
SYSTEM CONTROL (SS-133)

3-15. INDEX BLOCK DIAGRAM

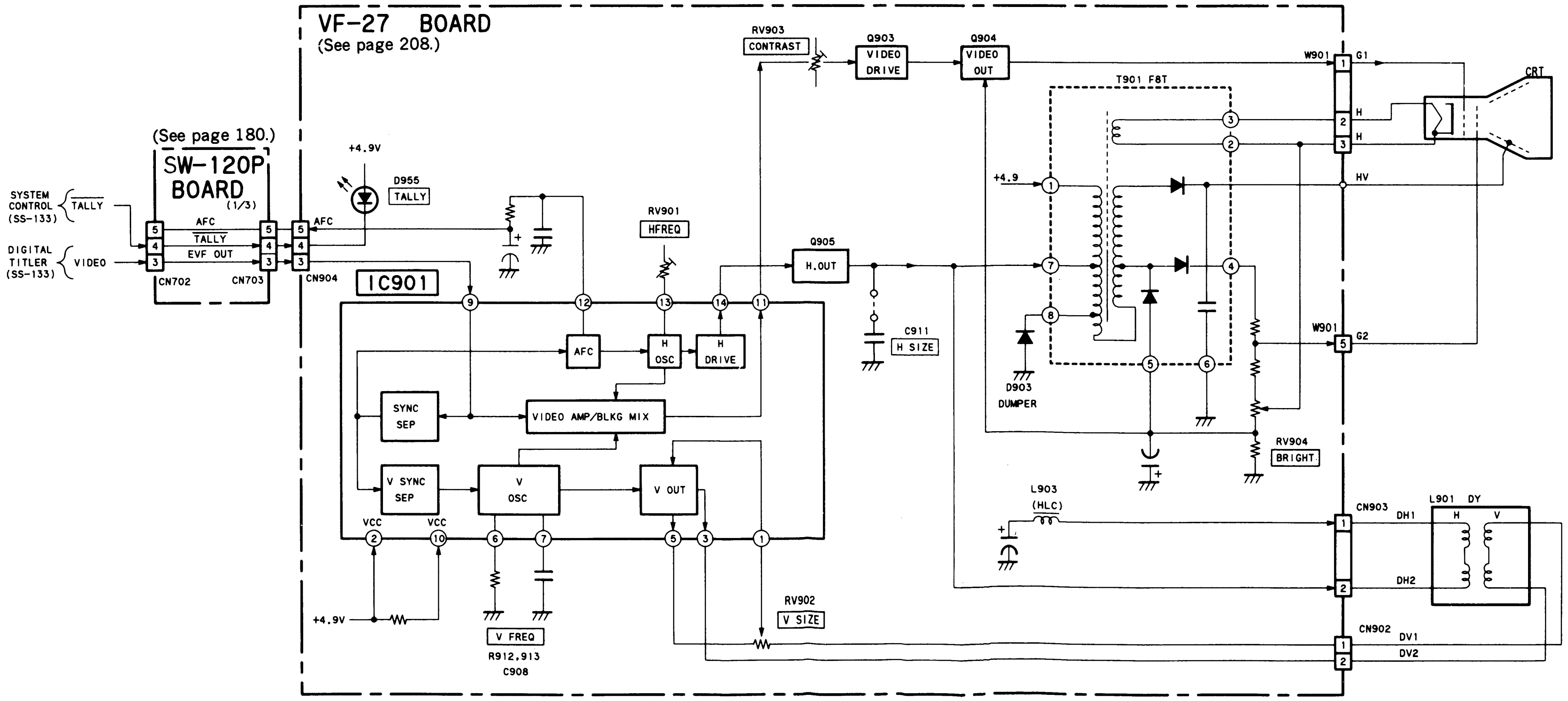

VIDEO(2) BLOCK
(See page 141, 163.)
SS-133 BOARD
HR-10 BOARD
VIDEO HEAD
CH1
CH2
REC/PB AMP
CN009
RF SWP
REC PCM
PB PCM RF
AF REC
REC AREA
RAMP
DR SWP
CC-33P BOARD(INDEX)
(See page 185.)
W901
HPF
Q913,914
REC PCM AMP
Q915,916
PB PCM AMP
IC911
INDEX RF
LPF
LIMITER
X2
D
Q
C
PHASE COMP
LPF
VCO
REC
PB
A Vcc
D Vcc
STBY
R934
MODE
AREA
REC AREA
5V
RV910
PB VCO
IC910
MARKER CONTROL
X CLR
X CEM
X SCK
SO
SI
RF SW
FMDT
FMCK
RF MOD
RF AR
HPLS
MASK
HSYN
DR SW
DETS
X FOH
FOLL
PCKO
PCLK
X910
11.58MHz
VDD
RAR C
RAR A
RAMP
SS 5V
(W901 26)
Q918
Q917
Q912
POWER SAVE
MK CS
SCK
DATA TO MSTR
DATA TO SLVE
SYSTEM CONTROL (SS-133)
RF SWP
SERVO (SS-133)
CN009
SS-133 BOARD
AFR HD
DUB AREA
VIDEO(1) (VA-62)
DUB AREA
H SYNC
DR SWP
DIGITAL TITLER (SS-133)
IC910 32 REC/PB 2.4Vp-p(11.58MHz)
IC910 30 REC/PB 5.6Vp-p(11.58MHz)

3-16. VIEWFINDER (A) BLOCK DIAGRAM



VF-26 BOARD
(See page 207.)
SW-120P BOARD (1/3)
(See page 180.)
CONTROL (SS-133)
TALLY
DIGITAL TITLER (SS-133)
VIDEO
AFC
TALLY
EVF OUT
CN702
CN703
CN904
+4.9V
D955
TALLY
IC901
CP 901
AFC
SYNC SEP
V SYNC SEP
V OSC
V OUT
H OSC
H DRIVE
VIDEO AMP/BLKG MIX
Vcc
+4.9V
V FREQ
R925,926
C919
CP901
V SIZE
CP901
CONTRAST
Q904
VIDEO OUT
Q903
H.OUT
C905
H SIZE
T901 FBT
+5V
D903
DUMPER
RV901
FOCUS
CP901
BRIGHT
L903
(HLC)
W901
G1
H1
H2
HV
G3
G2
CRT
CN901
DH1
DH2
L901 DY
H
V
CN902
DV1
DV2

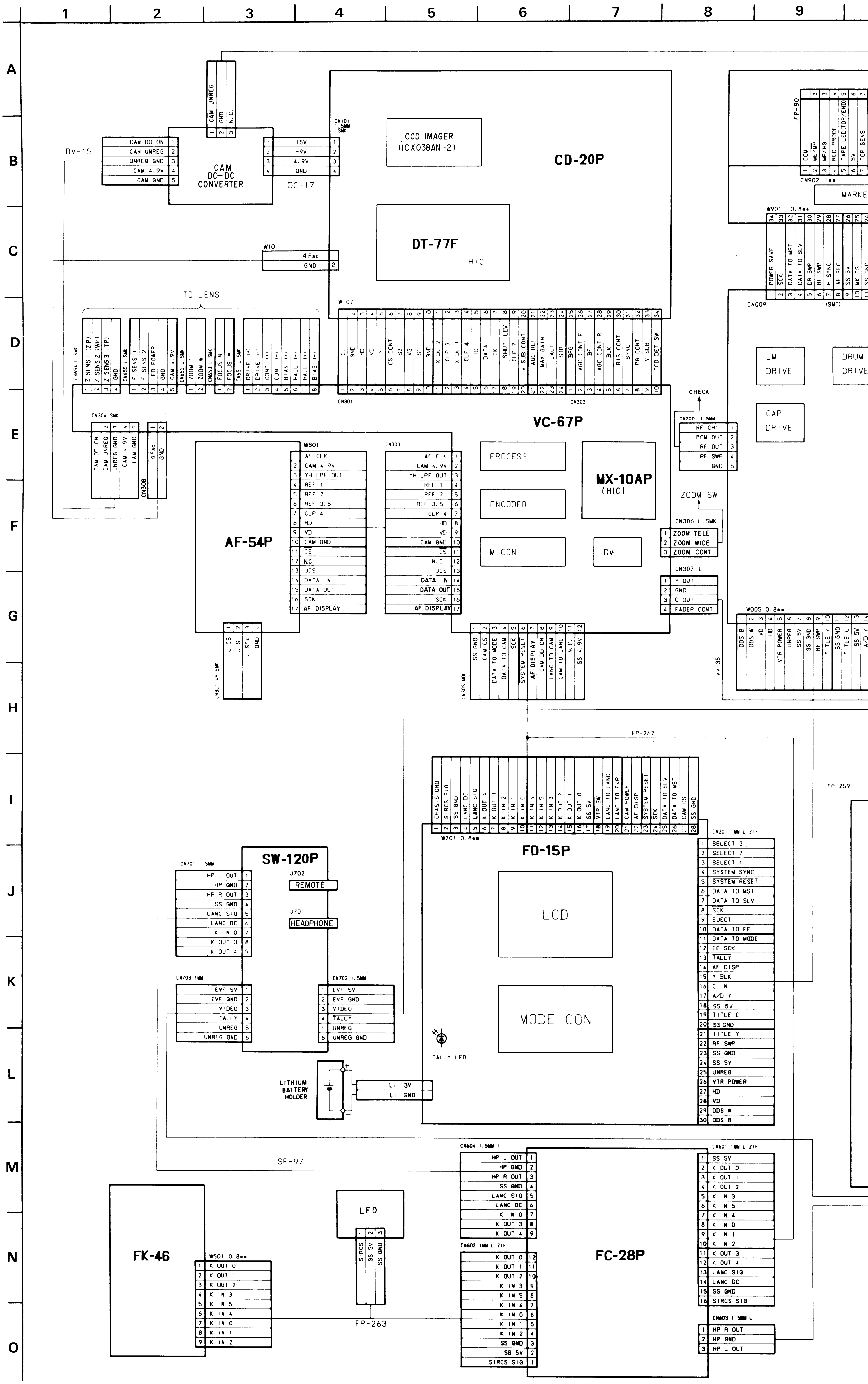
3-17. VIEWFINDER (B) BLOCK DIAGRAM



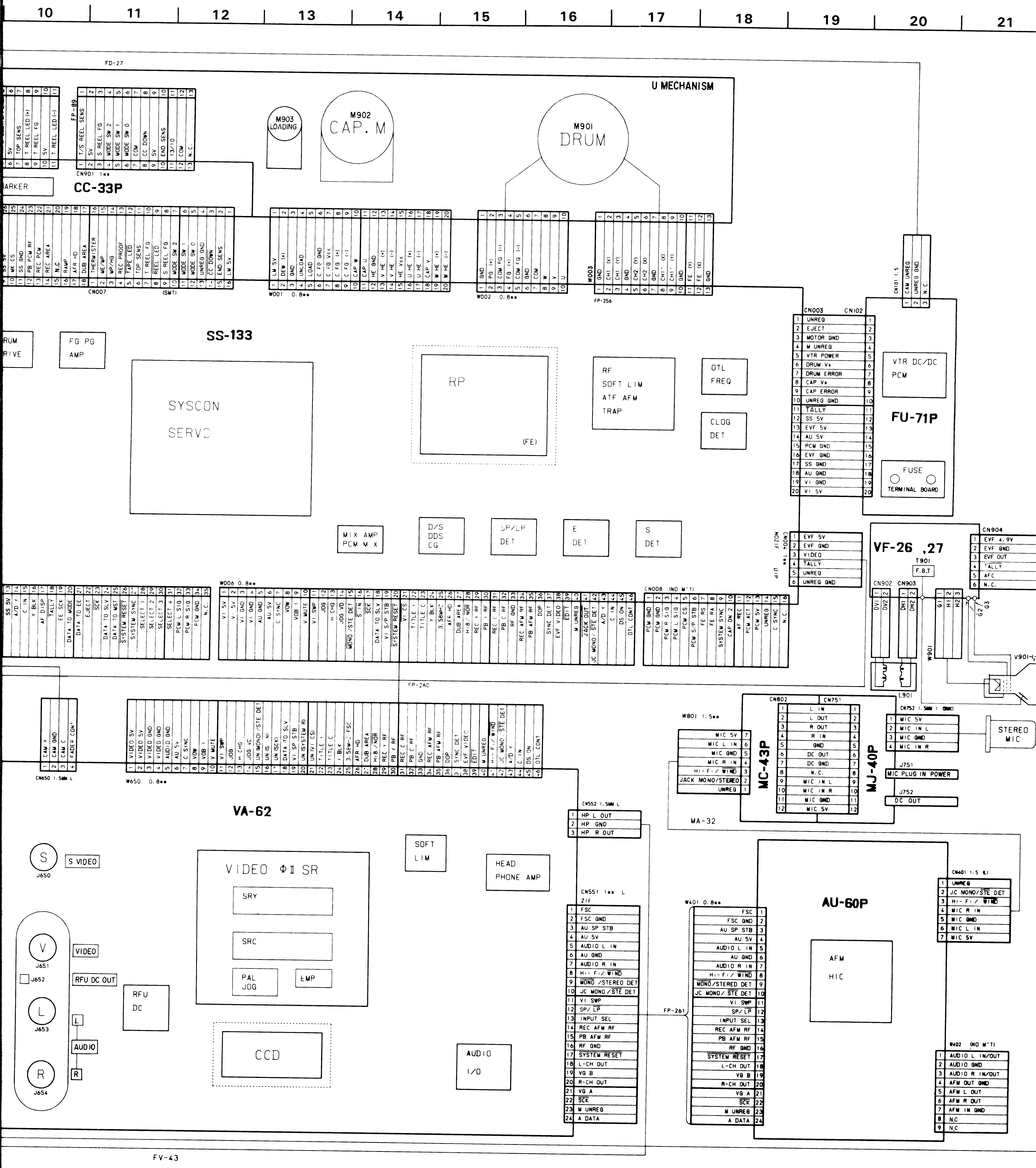
VF-27 BOARD
(See page 208.)
(See page 180.)
SW-120P BOARD (1/3)
SYSTEM CONTROL (SS-133)
TALLY
DIGITAL TITLER (SS-133)
VIDEO
AFC
TALLY
EVF OUT
CN702
CN703
CN904
+4.9V
D955
TALLY
IC901
RV901
HFREQ
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
VCC
+4.9V
V FREQ
R912,913
C908
RV902
V SIZE
RV903
CONTRAST
Q903
VIDEO DRIVE
Q904
VIDEO OUT
Q905
H.OUT
C911
H SIZE
T901 FBT
+4.9
D903
DUMPER
RV904
BRIGHT
L903
(HLC)
W901
G1
H
HV
G2
CRT
CN903
DH1
DH2
L901 DY
H
V
CN902
DV1
DV2

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
CAM UNREG
GND
N.C.
DV-15
CAM DD ON
CAM UNREG
UNREG GND
CAM 4.9V
CAM GND
CAM DC-DC CONVERTER
15V
-9V
4.9V
GND
DC-17
CN101 1.5MM SMK
CCD IMAGER (ICX038AN-2)
CD-20P
DT-77F
HIC
W101
4Fsc
GND
TO LENS
W102
CN654 L SMK
Z SENS 1 (ZP)
Z SENS 2 (WP)
Z SENS 3 (TP)
CN655 L SMK
F SENS 1
F SENS 2
LED POWER
CAM 4.9V
CN652 L SMK
ZOOM T
ZOOM W
CN653 L SMK
FOCUS N
FOCUS
CN651 L SMK
DRIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
BIAS (+)
HALL (-)
HALL (+)
BIAS (-)
CL
HD
VD
Y
CS CONT
S2
VG
S1
X DL 2
CLP 3
X DL 1
CLP 4
ID
DATA
CK
SHUT LEV
CLP 2
V SUB CONT
AGC REF
MAX GAIN
LALT
STB
BFG
AGC CONT F
BF
AGC CONT R
BLK
IRIS CONT
SYNC
PB CONT
V SUB
CCD DET SW
CN301
CN302
CN304 SMK
CN308
VC-67P
W801
CN303
AF CLK
YH LPF OUT
REF 1
REF 2
REF 3.5
CLP 4
CAM GND
CS
N.C.
JCS
DATA IN
DATA OUT
SCK
AF DISPLAY
AF-54P
J CS
J SI
J SCK
CN801 4P SMK
PROCESS
ENCODER
MICON
MX-10AP (HIC)
DM
CHECK
CN200 1.5MM
RF CH1
PCM OUT
RF OUT
RF SWP
ZOOM SW
CN306 L SMK
ZOOM TELE
ZOOM WIDE
ZOOM CONT
CN307 L
Y OUT
C OUT
FADER CONT
SS GND
CAM CS
DATA TO MODE
DATA TO CAM
SYSTEM RESET
LANC TO CAM
SS 4.9V
CN305 MOL
VV-35
FP-90
COM
ME/MP
MP/HG
REC PROOF
TAPE LED(TOP/END)
5V
TOP SENS
CN902 1MM
MARKE
W901 0.8MM
POWER SAVE
DATA TO MST
DATA TO SLV
DR SWP
RF SWP
H SYNC
AF REC
SS 5V
MK CS
CN009
(SMT)
LM DRIVE
DRUM DRIVE
CAP DRIVE
W005 0.8MM
DDS B
DDS W
VTR POWER
UNREG
TITLE Y
TITLE C
A/D Y
FP-262
FP-259
CH4SIS GND
SIRCS SIG
LANC DC
LANC SIG
K OUT
K IN
SS 5V
VTR SW
LANC TO LANC
LANC TO EVR
CAM POWER
AF DISP
W201 0.8MM
FD-15P
LCD
MODE CON
TALLY LED
CN201 1MM L ZIF
SELECT 3
SELECT 2
SELECT 1
SYSTEM SYNC
EJECT
DATA TO EE
EE SCK
TALLY
Y BLK
C IN
SS GND
CN701 1.5MM
HP L OUT
HP GND
HP R OUT
SW-120P
J702
REMOTE
J701
HEADPHONE
CN703 1MM
EVF 5V
EVF GND
VIDEO
UNREG GND
CN702 1.5MM
LITHIUM BATTERY HOLDER
LI 3V
LI GND
SF-97
CN604 1.5MM
CN601 1MM L ZIF
FK-46
LED
SIRCS
FP-263
W501 0.8MM
CN602 1MM L ZIF
FC-28P
SIRCS SIG
CN603 1.5MM L


10
11
12
13
14
15
16
17
18
19
20
21
FD-27
U MECHANISM
M903 LOADING
M902 CAP. M
M901 DRUM
FP-89
CN901 1mm
CC-33P
CN007
(SMT)
W001 0.8mm
W002 0.8mm
W003
FP-256
CN101 1.5
CN003
CN102
SS-133
DRUM DRIVE
FG PG AMP
SYSCON SERVO
RP
(FE)
RF SOFT LIM ATF AFM TRAP
OTL FREQ
CLOG DET
VTR DC/DC PCM
FU-71P
FUSE TERMINAL BOARD
MIX AMP PCM MIX
D/S DDS CG
SP/LP DET
E DET
S DET
CN004 1mm DIP
VF-26 ,27
T901 F.B.T
CN902
CN903
CN904
W901
L901
V901
W006 0.8mm
CN008 (NO M'T)
FP-260
CN650 1.5mm L
W650 0.8mm
W801 1.5mm
CN802
CN751
MC-43P
MJ-40P
CN752 1.5mm
STEREO MIC
J751
MIC PLUG IN POWER
J752
DC OUT
MA-32
CN552 1.5mm L
HP L OUT
HP GND
HP R OUT
VA-62
S
S VIDEO
J650
VIDEO ΦII SR
SRY
SRC
PAL JOG
EMP
SOFT LIM
HEAD PHONE AMP
CN551 1mm L
ZIF
W401 0.8mm
AU-60P
AFM HIC
CN401 1.5 L
V
VIDEO
J651
J652
RFU DC OUT
RFU DC
L
J653
AUDIO
R
J654
CCD
AUDIO I/O
FP-261
W402 (NO M'T)
FV-43

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- ● : Through hole.
- ░ : Pattern from the side which enables seeing.
- ▒ : Pattern of the rear side. *
- Circled numbers refer to waveforms.

- **For schematic diagram.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W or 1/16W unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.

- All capacitors are in μF unless otherwise noted. pF : μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊡ : nonflammable resistor.
- ⊡ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repair. *
- ━ : B + Line *
- Circled numbers refer to waveforms. *
- ➾ : IN/OUT direction of B (+, –) line. *

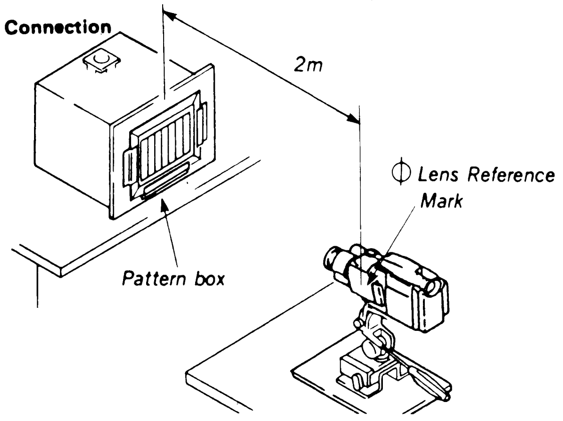
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

* Indicated by the color red.

- **For voltage and waveforms. (CAM REC mode)**
- Voltage and waveform measuring conditions: *
  (1) Sample object: Pattern box color bars. *
  (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more). *

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

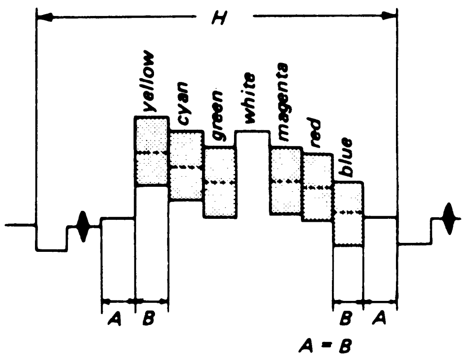

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig. a Video output waveform.

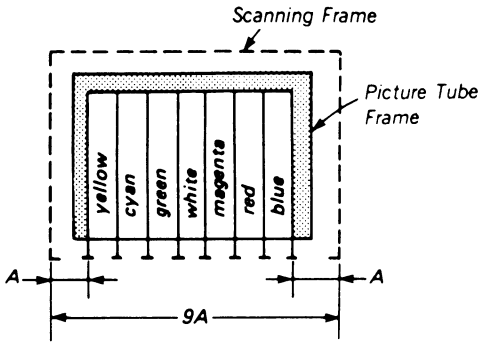
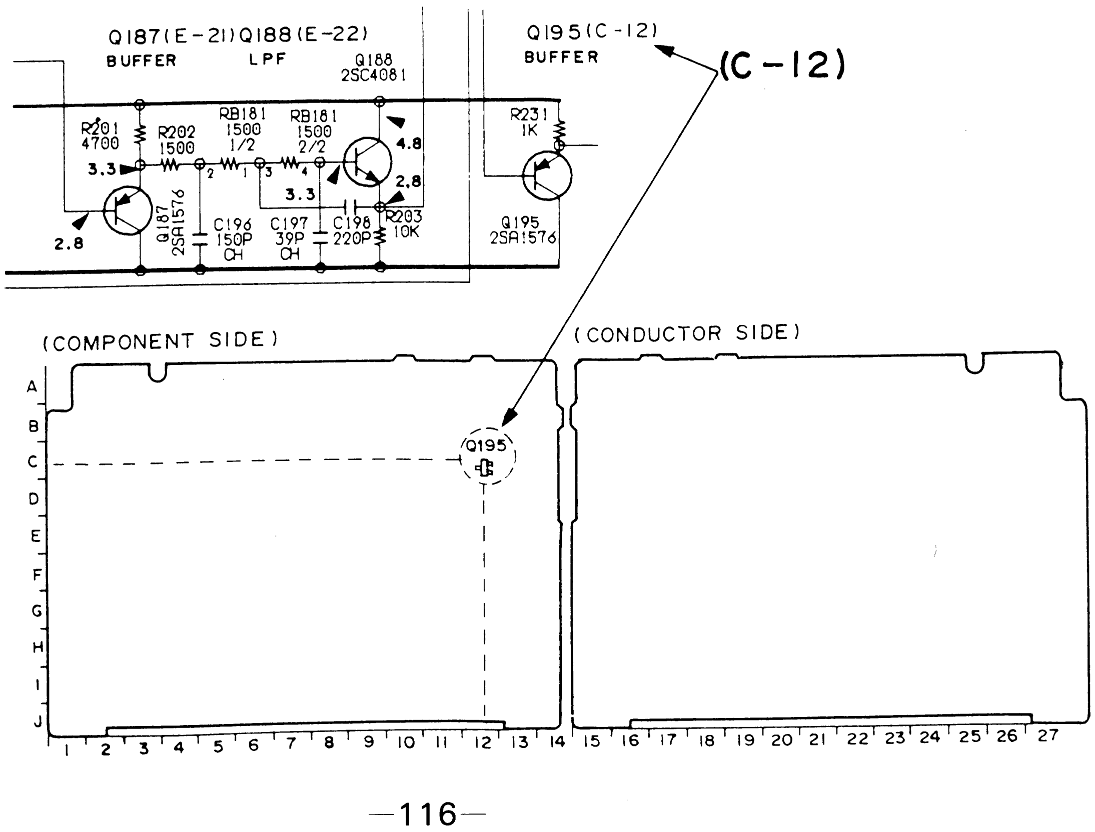

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

- **For voltage and waveforms. (REC/PB mode)**
- Voltages are dc between ground and measurement points. *
- Readings are taken with a color-bar signal input. *
- Readings are taken with a digital multimeter (DC10MΩ). *
- Voltage variations may be noted due to normal production tolerances. *

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated as shown below. This enables to find the location on the board easily when servicing.


Q187(E-21)Q188(E-22)
BUFFER
LPF
Q188
2SC4081
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
3.3
3.3
4.8
2.8
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
Q195(C-12)
BUFFER
R231
1K
Q195
2SA1576
(C-12)
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
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27

Precautions for replacement of CCD imager block.

- With a pair of IC101 (CCD imager) on the CD-20P complete board and IC001 (corrector ROM) on the DT-77F complete board, it is used a repair part of the CCD imager block.
  Since corrector ROM IC is manufactured to match the CCD imager, replacement of a single unit of the CCD imager corrector ROM cannot be allowed.
- When both a CCD imager and the corrector ROM, replace both the CCD imager and the corrector ROM, when a corrector ROM is not mounted on the service set, install a corrector ROM which is supplied anew.
- IC101 (CCD imager) is not mounted on the CD-20P complete board to be supplied as a repair part, and IC001 (corrector ROM) is not mounted on the DT-77F complete board to be supplied as a repair part. When the respective boards are replaced, remove the respective ICs from the old boards and install them to the new once respectively.
- After the CCD imager block has been replaced, perform the entire adjustments of the camera section.
- CCD imager is structurally in case of being broken down by static electricity.
  For this reason, take care to handle it as well as MOS IC. Moreover, care should be taken for dust not to be stuck on the light reseiving section and for strong light not to get into there.

[Semiconductor for Correction List Display]
Part code and part name of the semiconductor for correction of the print board is described in the space of each print figure. Use this list when ordering parts.

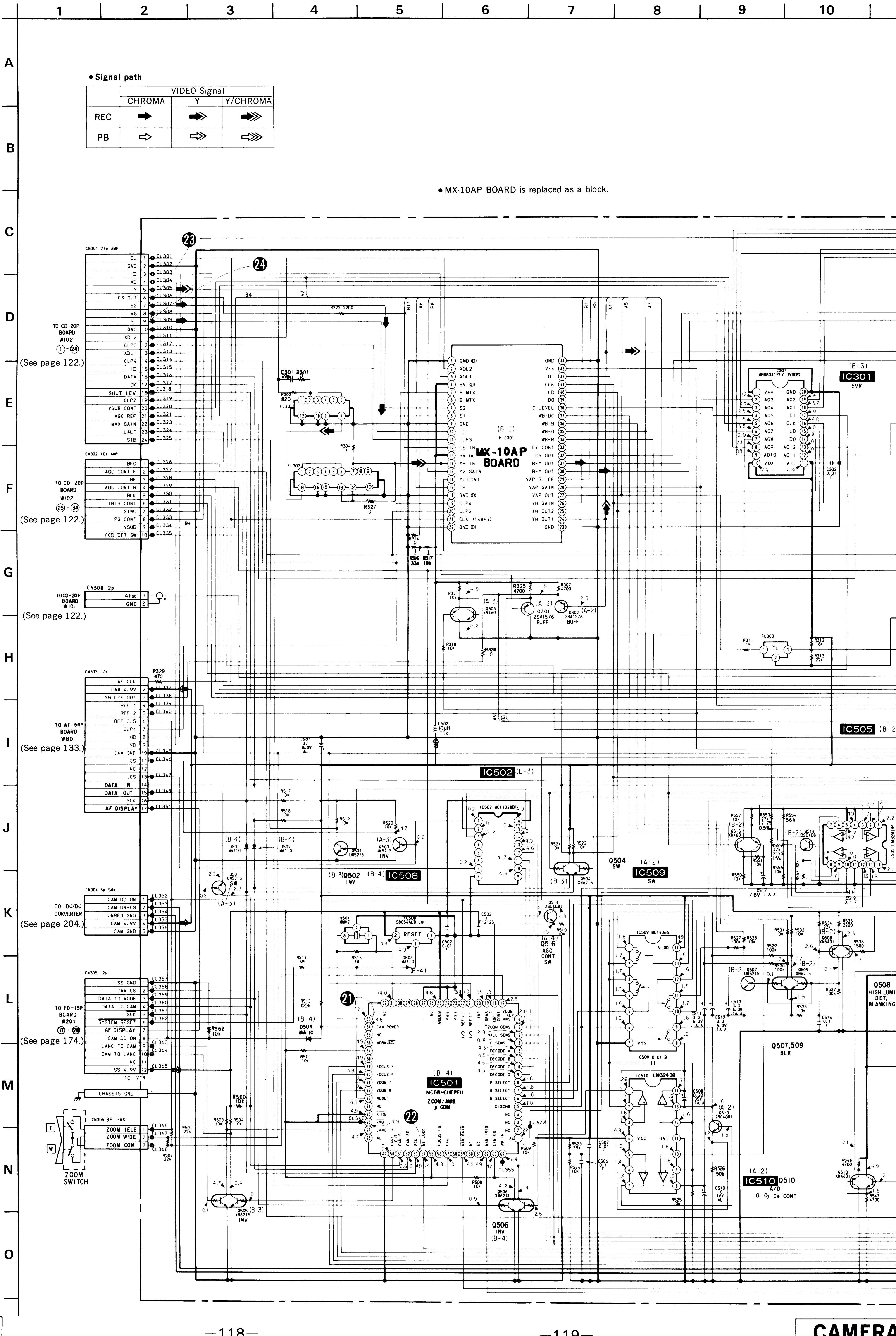
VC-67P (CAMERA PROCESS, ZOOM/FOCUS), CD-20P (CCD IMAGER) SCHEMATIC DIAGRAM

—Ref. No. VC-67P, CD-20P BOARDS : 4000 series—

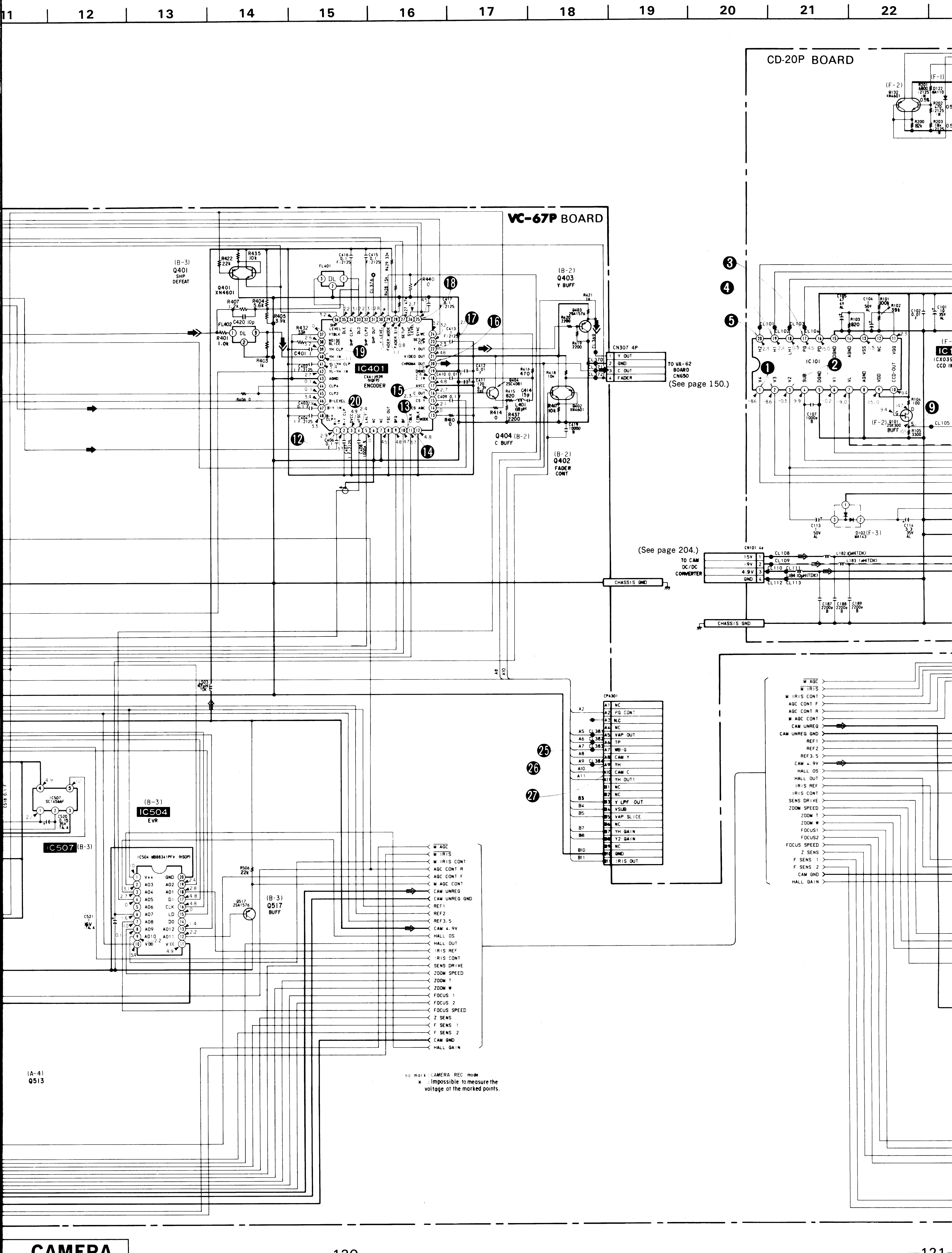
• Signal path

	VIDEO Signal		
	CHROMA	Y	Y/CHROMA
REC	➡	➡➡	➡➡➡
PB	⇨	⇨⇨	⇨⇨⇨

• MX-10AP BOARD is replaced as a block.



1 2 3 4 5 6 7 8 9 10
A B C D E F G H I J K L M N O
CN301 24p AMP
CL GND HD VD Y CS OUT S2 VG S1 GND XDL2 XDL1 CLP3 XDL1 CLP4 ID DATA CK SHUT LEV CLP2 VSUB CONT AGC REF MAX GAIN LALT STB
CL301 – CL325
TO CD-20P BOARD W102 ①-㉔
(See page 122.)
CN302 10p AMP
BFG AGC CONT F BF AGC CONT R BLK IRIS CONT SYNC PG CONT VSUB CCD DFT SW
CL326 – CL335
TO CD-20P BOARD W102 ㉕-㉞
(See page 122.)
CN308 2p
4Fsc GND
TO CD-20P BOARD W101
(See page 122.)
CN303 17p
AF CLK CAM 4.9V YH LPF OUT REF 1 REF 2 REF 3.5 CLP4 HD VD CAM ON CS NC JCS DATA IN DATA OUT SCK AF DISPLAY
TO AF-54P BOARD W801
(See page 133.)
CN304 5p
CAM DD ON CAM UNREG UNREG GND CAM 4.9V CAM GND
TO DC/DC CONVERTER
(See page 204.)
CN305 12p
SS GND CAM CS DATA TO MODE DATA TO CAM SCK SYSTEM RESET AF DISPLAY CAM DD ON LANC TO CAM CAM TO LANC NC SS 4.9V
TO FD-15P BOARD W201 ⑰-㉘
(See page 174.)
TO VTR
CHASSIS GND
CN306 3P SMK
ZOOM TELE ZOOM WIDE ZOOM COM
T W
ZOOM SWITCH
㉑ ㉒ ㉓ ㉔
R329 470
R322 2200
C301 R301
R302 820
FL301 FL302
R304 1k
R327 0
R314 0
R316 33k R317 18k
MX-10AP BOARD
(B-2) HIC301
GND XDL2 XDL1 5V R MTX B MTX S2 S1 GND ID CLP3 CS IN 5V YH IN Y2 GAIN Yt CONT TP GND CLP4 CLP2 CLK (14MHz) GND
GND Vss DI CLK LD DO C-LEVEL WB-DC WB-B WB-G WB-R Cr CONT CS OUT R-Y OUT B-Y OUT VAP SLICE VAP GAIN VAP OUT YH GAIN YH OUT2 YH OUT1 GND
B4 A2 B11 A6 B8 B7 B5 A11 A5 A7
R321 10k
R325 4700
R307 4700
Q303 XN4601 (A-3)
Q301 2SA1576 BUFF (A-3)
Q302 2SA1576 BUFF (A-2)
R318 10k
R328 0
IC301 MB88341PFV (VSOP)
(B-3) IC301 EVR
Vss AO3 AO4 AO5 AO6 AO7 AO8 AO9 AO10 VDD GND AO2 AO1 DI CLK LD DO AO12 AO11 VCC
C302 0.01
R311 1k FL303 YL
R312 18k R313 22k
IC505 (B-2)
L502 10µH
C501 47 6.3V
IC502 (B-3)
IC502 MC14028BF
R517 10k R518 10k
D501 MA110 (B-4)
D502 MA110 (B-4)
R519 10k
Q502 UN5215 (B-3) INV
R520 10k
Q503 UN5215 INV (A-3)
Q501 UN5215 SW (A-3)
IC508 (B-4)
R521 10k R522 10k
Q504 XN6215 (B-3)
Q504 SW (A-2)
IC509 SW
R552 10k R553 27k R554 56k R555 47k R556 10k R550 10k R551 10k R557 82k
Q515 XN4601 (B-2)
Q514 2SC4081 (B-2)
IC505 LM324DR
C517 1/16V TA A
C519 0.1
X501 8MHz
IC508 S80544LB-LM RESET
C503 2125
C502 0.01
D503 MA110 (B-4)
R514 10k R515 1M
Q516 2SC4081 AGC CONT SW (A-4)
R510 10k
IC509 MC14066 VDD VSS
C509 0.01 B
R527 100k R528 10k
R531 10k R532 10k
R529 100k
R530 100k
Q507 UN5215 (B-2)
Q509 XN6215 (B-2)
R534 22k R535 2200
Q508 XN6401 (B-2)
R536 1500
R537 100k
R533 10k
Q508 HIGH LUMI DET, BLANKING
Q507,509 BLK
C511 3.3 6.3V
C512 3.3 6.3V TA A
C513 3.3 6.3V TA A
C514 0.1
R513 100k
D504 MA110 (B-4)
R562 10k
R511 10k
(B-4) IC501 NC68HC11EPFU ZOOM/AWB µ COM
CAM POWER NC NORM/ADJ FOCUS N FOCUS W ZOOM T ZOOM W RESET XIRQ IRQ NC LANC IN
MODEB VSS A/D REF A/D REF ANS ZOOM KEY ZOOM SENS HALL SENS F SENS DECODE A DECODE B DECODE C DECODE D R SELECT G SELECT B SELECT DISCHG
LANC OUT CAM CS CAM SO SCK SE LOCK FOCUS FG PA6 MAN GAIN NC MR IRIS CAM CS NC
R560 10k
R503 10k R504 10k
R501 22k R502 22k
CL366 CL367 CL368
Q505 XN6215 (B-3) INV
R508 10k
Q506 XN6213 INV (B-4)
R509 10k
CL355 CL677
R523 39k R524 10k
C507 0.0
C506 0.1
IC510 LM324DR VCC GND
C508 0.22 35V TA A
Q510 2SC4081 (A-2)
R526 150k
C510 10 16V AL
R525 10k
(A-2) IC510 Q510 A/D G Cy Ce CONT
R546 4700
Q513 XN4601
R547 4700


11
12
13
14
15
16
17
18
19
20
21
22
VC-67P BOARD
CD-20P BOARD
IC401
CXA1192R
ENCODER
(B-3) Q401 SHP DEFEAT
Q401 XN4601
(B-2) Q403 Y BUFF
Q403 2SA1576
Q404 (B-2) C BUFF
Q404 2SC4081
(B-2) Q402 FADER CONT
Q402 XN4601
CN307 4P
1 Y OUT
2 GND
3 C OUT
4 FADER
TO VA-62 BOARD CN650
(See page 150.)
IC101
ICX039
CCD IMAGER
(F-2) Q101 2SK300 BUFF
(F-2) Q132 XN4601
D102 (F-3) MA143
(See page 204.)
TO CAM DC/DC CONVERTER
CN101 4P
15V
-9V
4.9V
GND
CHASSIS GND
CHASSIS GND
CPA301
A1 NC
A2 PG CONT
A3 NC
A4 NC
A5 VAP OUT
A6 TP
A7 WB-G
A8 CAM Y
A9 YH
A10 CAM C
A11 YH OUT1
B1 NC
B2 NC
B3 Y LPF OUT
B4 VSUB
B5 VAP SLICE
B6 NC
B7 YH GAIN
B8 Y2 GAIN
B9 NC
B10 GND
B11 IRIS OUT
(B-3) IC504 EVR
IC504 MB88341PFV (VSOP)
(B-3) Q517 BUFF
Q517 2SA1576
IC507 (B-3)
IC507 SC14566F
(A-4) Q513
M AGC
M IRIS
M IRIS CONT
AGC CONT R
AGC CONT F
M AGC CONT
CAM UNREG
CAM UNREG GND
REF1
REF2
REF3.5
CAM 4.9V
HALL OS
HALL OUT
IRIS REF
IRIS CONT
SENS DRIVE
ZOOM SPEED
ZOOM T
ZOOM W
FOCUS 1
FOCUS 2
FOCUS SPEED
Z SENS
F SENS 1
F SENS 2
CAM GND
HALL GAIN
①
②
③
④
⑤
⑨
⑫
⑬
⑭
⑮
⑯
⑰
⑱
⑲
⑳
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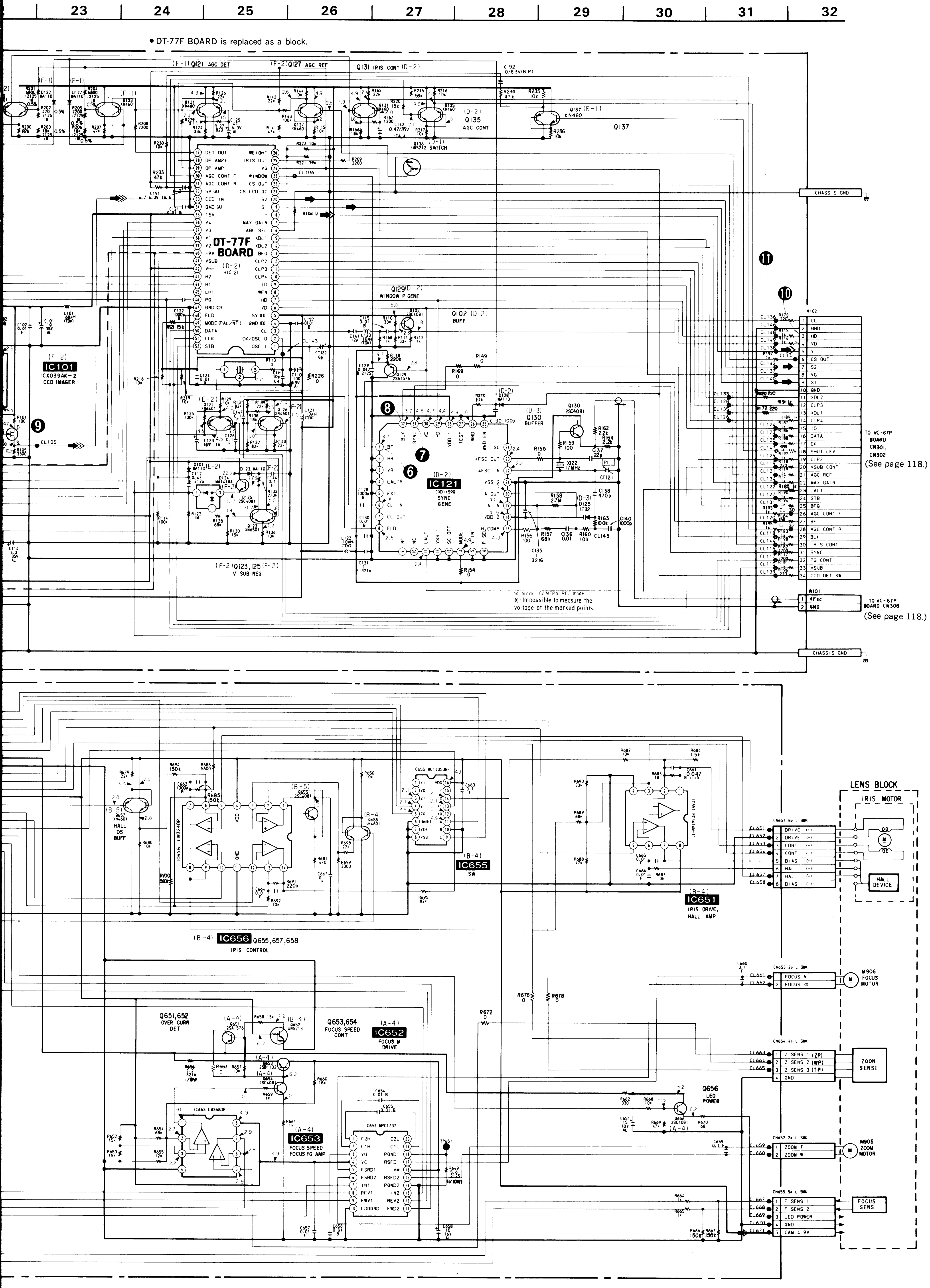
㉗

no mark : CAMERA REC mode
* : Impossible to measure the voltage at the marked points.


• DT-77F BOARD is replaced as a block.

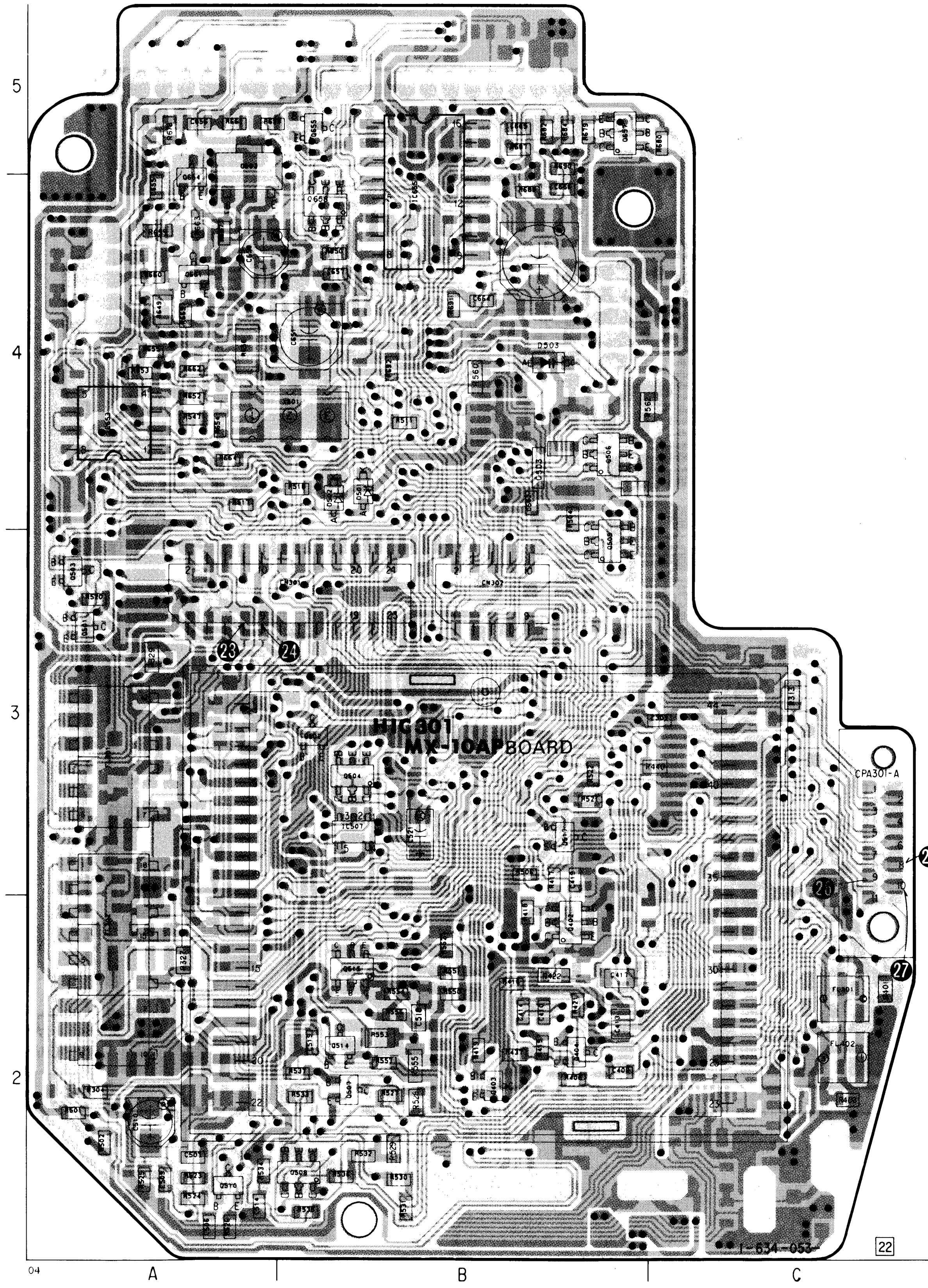
23
24
25
26
27
28
29
30
31
32
DT-77F BOARD
(F-1) Q121 AGC DET
(F-2) Q127 AGC REF
Q131 IRIS CONT (D-2)
Q135 AGC CONT
Q137
Q136 UN5212 SWITCH
CHASSIS GND
(F-2) IC101 ICX039AK-2 CCD IMAGER
Q129 (D-2) WINDOW P GENE
Q102 (D-2) BUFF
Q130 2SC4081 BUFFER
(D-2) IC121 CXD1159Q SYNC GENE
(F-2) Q123,125 (F-2) V SUB REG
TO VC-67P BOARD CN301, CN302
(See page 118.)
TO VC-67P BOARD CN308
(See page 118.)
no mark : CAMERA REC mode
✱ : Impossible to measure the voltage at the marked points.
LENS BLOCK
IRIS MOTOR
HALL DEVICE
(B-4) IC656 Q655,657,658 IRIS CONTROL
(B-4) IC655 SW
(B-4) IC651 IRIS DRIVE, HALL AMP
Q657 HALL OS BUFF
M906 FOCUS MOTOR
ZOOM SENSE
M905 ZOOM MOTOR
FOCUS SENS
Q651,652 OVER CURR DET
Q653,654 FOCUS SPEED CONT
(A-4) IC652 FOCUS M DRIVE
(A-4) IC653 FOCUS SPEED FOCUS FG AMP
Q656 LED POWER
IC653 LM358DR
IC652 MPC1737
IC655 MC14053BF

CAMERA CAMERA

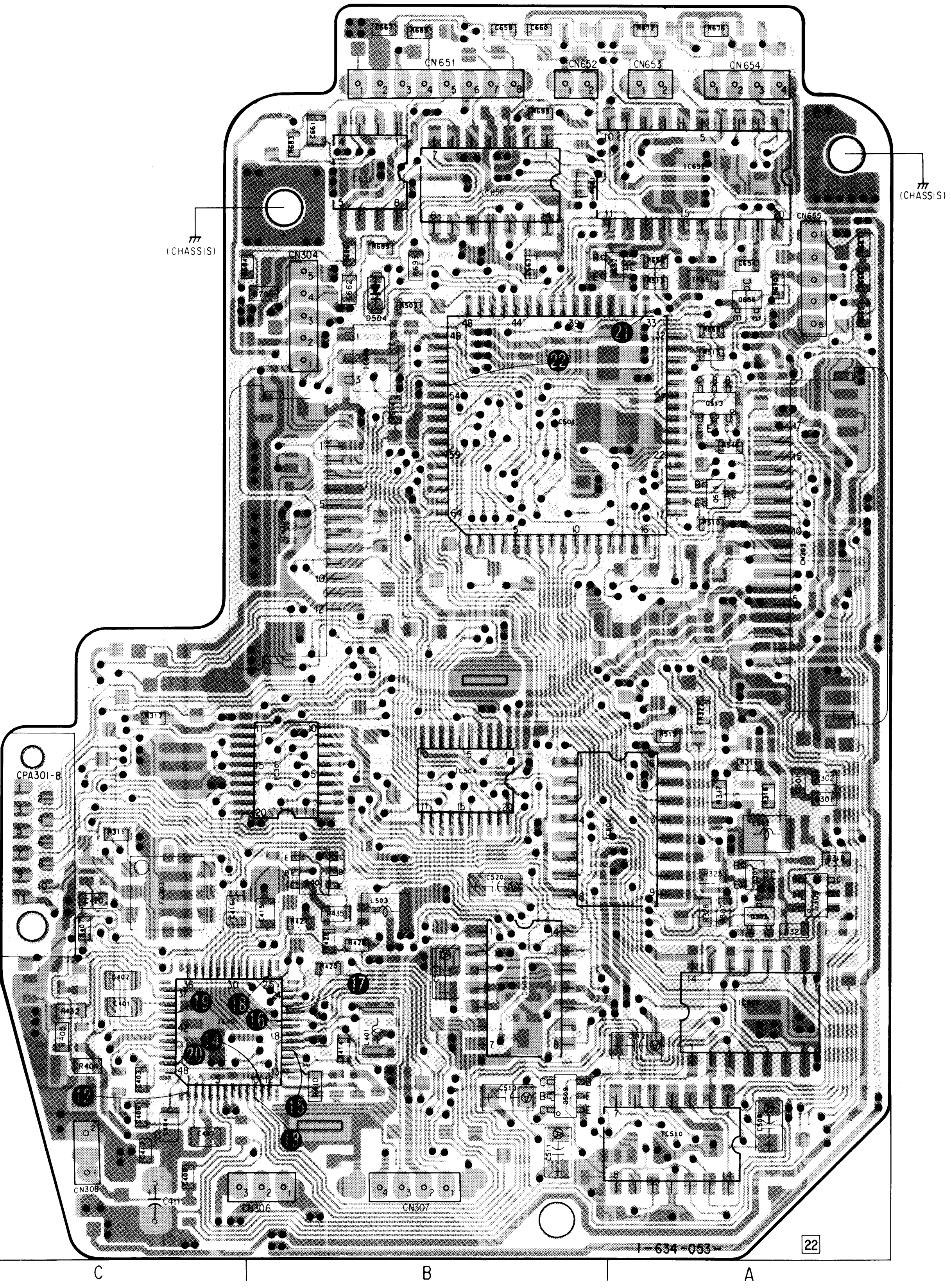
VC-67P (CAMERA PROCESS, ZOOM/FOCUS), CD-20P (CCD IMAGER) PRINTED WIRING BOARD

—Ref. No. VC-67P, CD-20P BOARDS : 4000 series—

VC-67PBOARD (COMPONENT SIDE)


5
4
3
2
HIC601
MX-10AP BOARD
CPA301-A
23
24
25
26
27
1-634-053-
22
04
A
B
C

VC-67PBOARD (CONDUCTOR SIDE)


(CHASSIS)
(CHASSIS)
CN651
CN652
CN653
CN654
CN304
CPA301-B
CN306
CN307
CN308
12
13
14
15
16
17
18
19
20
21
22
1-634-053-
22
C
B
A

< DIODE >

D501	8-719-404-46	MA110
D502	8-719-404-46	MA110
D503	8-719-404-46	MA110
D504	8-719-404-46	MA110

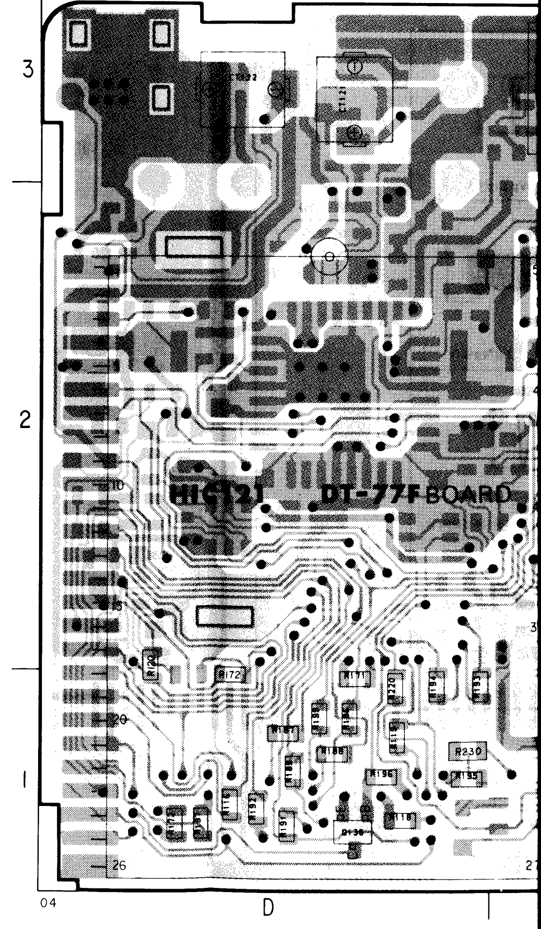
< IC >

IC301	8-759-946-00	MB88341PFV
IC401	8-752-038-XX	CXA1392R
IC501	8-759-038-38	MC68HC11EPFU
IC502	8-759-008-95	MC14028BF
IC504	8-759-946-00	MB88341PFV
IC505	8-759-998-96	LM324D
IC507	8-759-030-74	SC14S66F
IC508	8-759-937-56	S-8054ALB-LM-S
IC509	8-759-008-67	MC14066BF
IC510	8-759-998-96	LM324D
IC651	8-759-981-82	RC3414M
IC652	8-759-037-20	MPC1737M
IC653	8-759-998-98	LM358D
IC655	8-759-300-71	HD14053BFP
IC656	8-759-998-96	LM324D

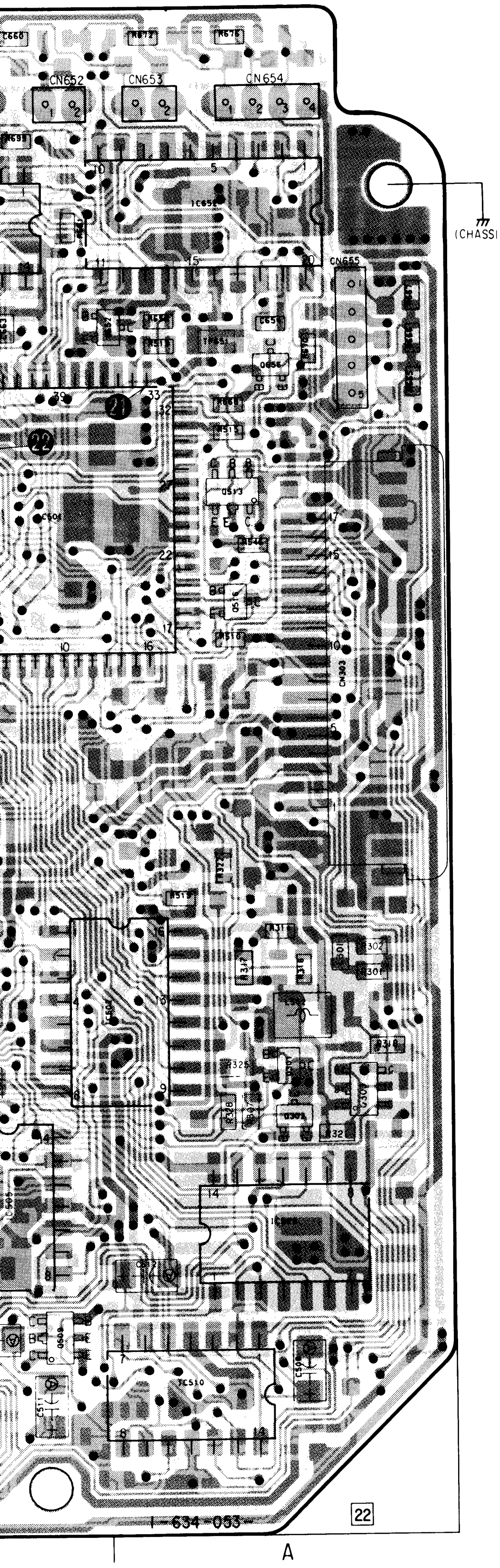
< TRANSISTOR >

Q301	8-729-9
Q302	8-729-9
Q303	8-729-4
Q401	8-729-4
Q402	8-729-4
Q403	8-729-9
Q404	8-729-9
Q501	8-729-4
Q502	8-729-4
Q503	8-729-4
Q504	8-729-4
Q505	8-729-4
Q506	8-729-4
Q507	8-729-4
Q508	8-729-4
Q509	8-729-4
Q510	8-729-9
Q513	8-729-4
Q514	8-729-9
Q515	8-729-4

CD-20P BOARD (COMPONENT SIDE)


3
2
1
HIC121
DT-77F BOARD
26
04
D

Be sure to always read "Precautions for replacement of
block" in page 117 when replacing the CD-20P boa
DT-77F board, complete and CCD imager block (IC101 o
board and IC001 on the DT-77F board)



< DIODE >

D501	8-719-404-46	MA110
D502	8-719-404-46	MA110
D503	8-719-404-46	MA110
D504	8-719-404-46	MA110

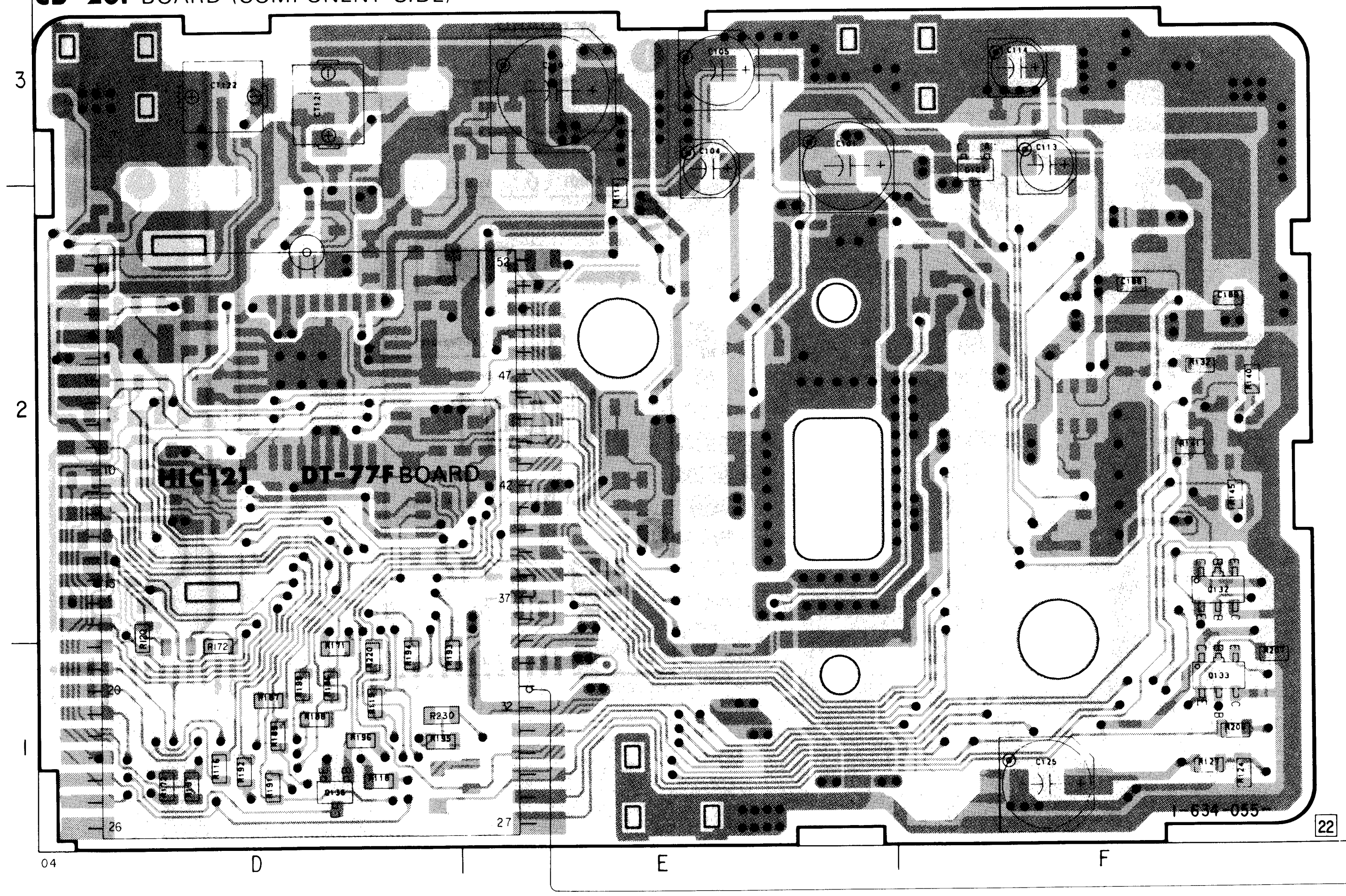
< IC >

IC301	8-759-946-00	MB88341PFV
IC401	8-752-038-XX	CXA1392R
IC501	8-759-038-38	MC68HC11EPFU
IC502	8-759-008-95	MC14028BF
IC504	8-759-946-00	MB88341PFV
IC505	8-759-998-96	LM324D
IC507	8-759-030-74	SC14S66F
IC508	8-759-937-56	S-8054ALB-LM-S
IC509	8-759-008-67	MC14066BF
IC510	8-759-998-96	LM324D
IC651	8-759-981-82	RC3414M
IC652	8-759-037-20	MPC1737M
IC653	8-759-998-98	LM358D
IC655	8-759-300-71	HD14053BFP
IC656	8-759-998-96	LM324D

< TRANSISTOR >

Q301	8-729-905-23	2SA1576-R
Q302	8-729-905-23	2SA1576-R
Q303	8-729-402-84	XN4601
Q401	8-729-402-84	XN4601
Q402	8-729-402-84	XN4601
Q403	8-729-905-23	2SA1576-R
Q404	8-729-905-35	2SC4081-R
Q501	8-729-420-50	UN5215
Q502	8-729-420-50	UN5215
Q503	8-729-420-50	UN5215
Q504	8-729-403-10	XN6215
Q505	8-729-403-10	XN6215
Q506	8-729-420-07	XN6213
Q507	8-729-420-50	UN5215
Q508	8-729-402-78	XN6401
Q509	8-729-403-10	XN6215
Q510	8-729-905-35	2SC4081-R
Q513	8-729-402-84	XN4601
Q514	8-729-905-35	2SC4081-R
Q515	8-729-402-84	XN4601
Q516	8-729-905-35	2SC4081-R
Q517	8-729-905-23	2SA1576-R
Q651	8-729-905-23	2SA1576-R
Q652	8-729-402-42	UN5213
Q653	8-729-106-60	2SB1115A
Q654	8-729-905-35	2SC4081-R
Q655	8-729-905-35	2SC4081-R
Q656	8-729-905-35	2SC4081-R
Q657	8-729-402-84	XN4601
Q658	8-729-402-84	XN4601

CD-20P BOARD (COMPONENT SIDE)



Be sure to always read "Precautions for replacement of CCD imager block" in page 117 when replacing the CD-20P board, complete, DT-77F board, complete and CCD imager block (IC101 on the CD-20P board and IC001 on the DT-77F board).

< DIODE >

D101	8-719-404-46	MA110
D102	8-719-404-52	MA143
D122	8-719-404-46	MA110
D123	8-719-404-46	MA110
D124	8-719-404-32	MA141WA
D125	8-719-949-46	1T32
D127	8-719-404-46	MA110
D128	8-719-404-46	MA110

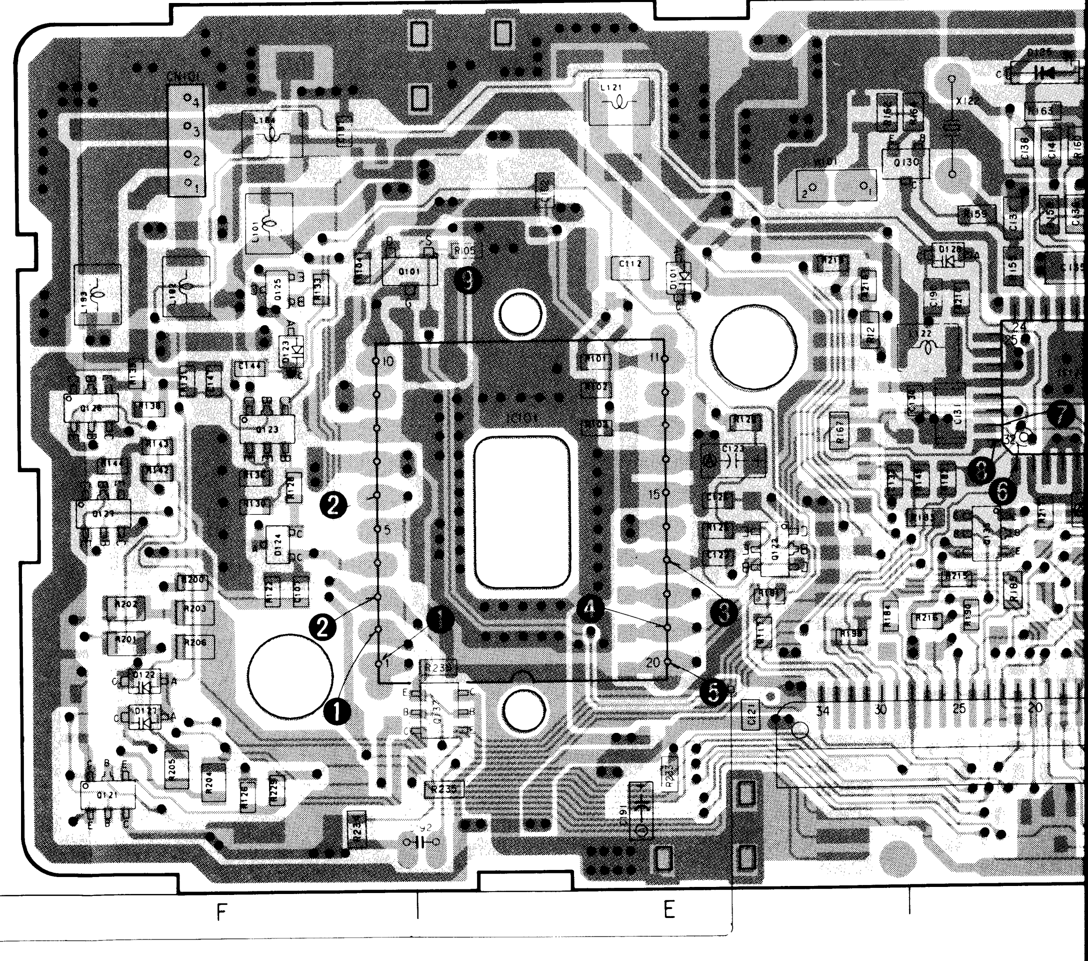
< IC >

IC121	8-752-326-08	CXD1159Q

< TRANSISTOR >

Q101	8-765-42
Q102	8-729-90
Q121	8-729-40
Q122	8-729-40
Q123	8-729-40
Q125	8-729-90
Q126	8-729-40
Q127	8-729-40
Q129	8-729-90
Q130	8-729-90
Q131	8-729-40
Q132	8-729-40
Q133	8-729-40
Q135	8-729-40
Q136	8-729-40
Q137	8-729-40

CD-20P BOARD (CONDUCTOR SIDE)



05-35 2SC4081-R
05-23 2SA1576-R
05-23 2SA1576-R
02-42 UN5213
06-60 2SB1115A

05-35 2SC4081-R
05-35 2SC4081-R
5-35 2SC4081-R
2-84 XN4601
2-84 XN4601

< DIODE >

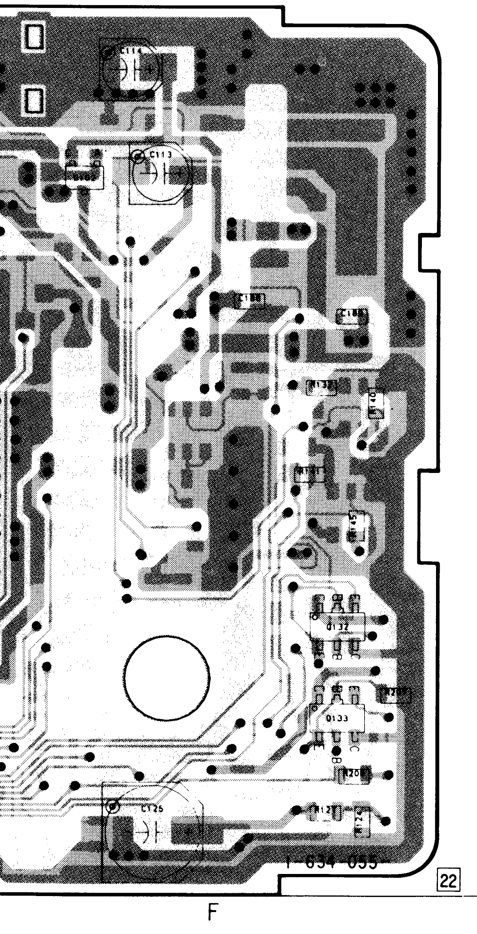
D101	8-719-404-46	MA110
D102	8-719-404-52	MA143
D122	8-719-404-46	MA110
D123	8-719-404-46	MA110
D124	8-719-404-32	MA141WA
D125	8-719-949-46	1T32
D127	8-719-404-46	MA110
D128	8-719-404-46	MA110

< IC >

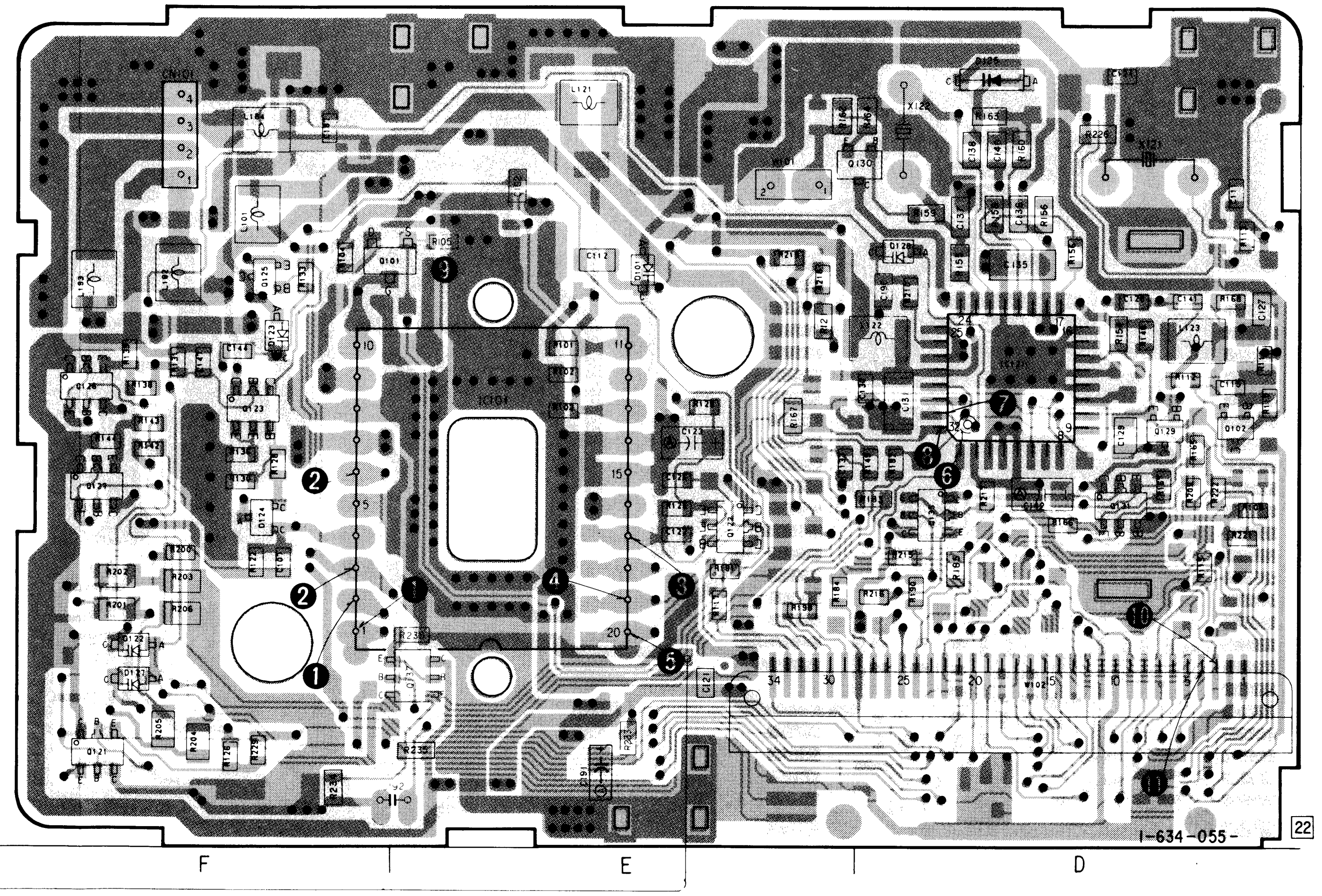
IC121	8-752-326-08	CXD1159Q

< TRANSISTOR >

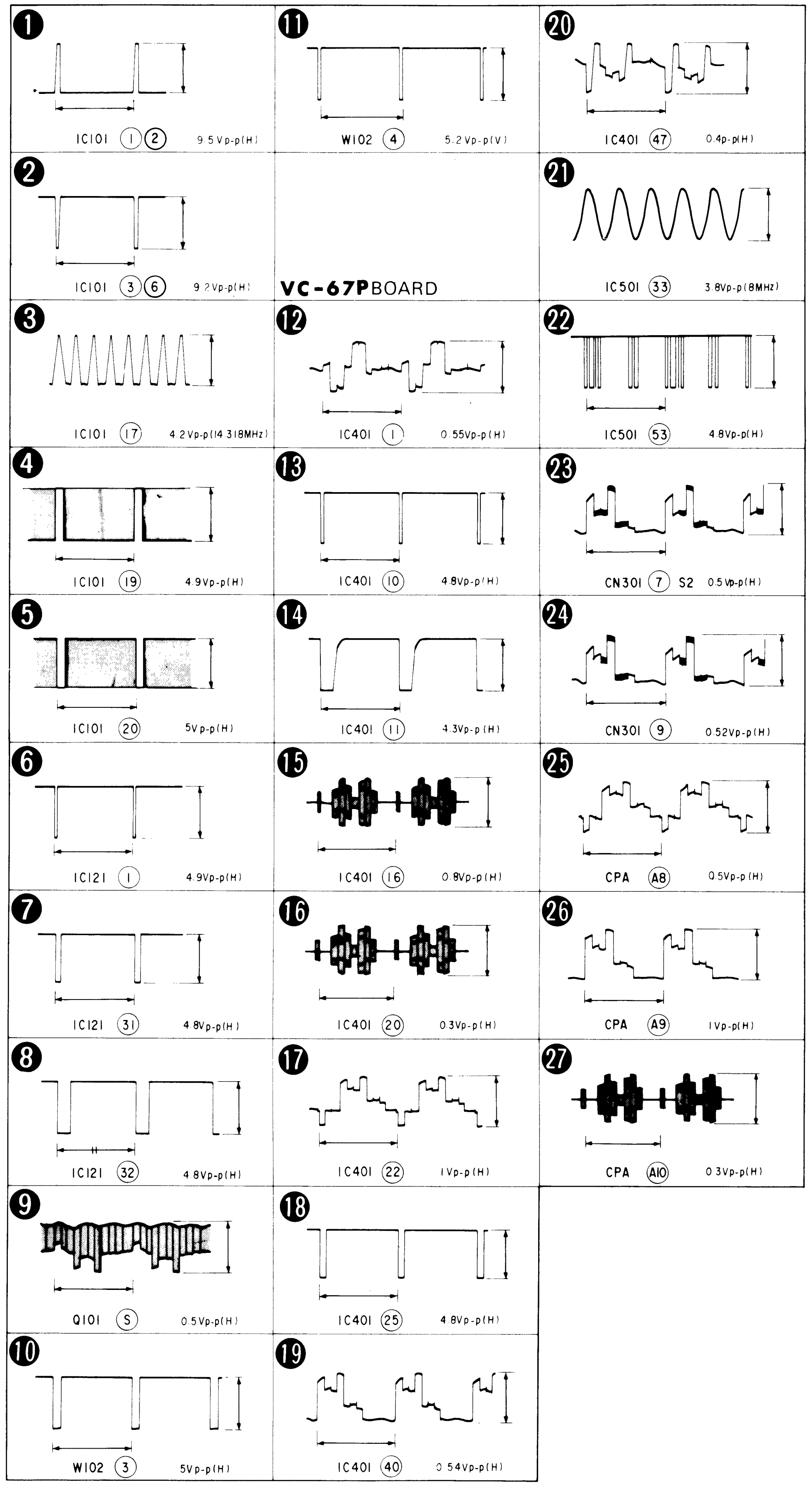
Q101	8-765-420-02	2SK300-3
Q102	8-729-905-35	2SC4081-R
Q121	8-729-402-84	XN4601
Q122	8-729-402-78	XN6401
Q123	8-729-402-19	XN6501
Q125	8-729-905-35	2SC4081-R
Q126	8-729-402-84	XN4601
Q127	8-729-402-84	XN4601
Q129	8-729-905-23	2SA1576-R
Q130	8-729-905-35	2SC4081-R
Q131	8-729-402-84	XN4601
Q132	8-729-402-84	XN4601
Q133	8-729-402-84	XN4601
Q135	8-729-402-84	XN4601
Q136	8-729-402-45	UN5212
Q137	8-729-402-84	XN4601



CD-20P BOARD (CONDUCTOR SIDE)



CD-20P BOARD



< DIODE >

D801	8-719-404-46	MA110

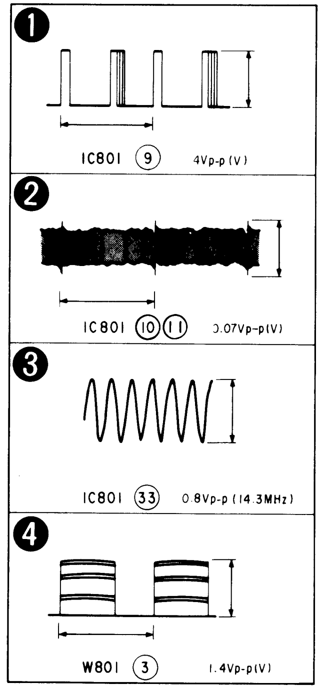
< IC >

IC801	8-752-334-68	CXD1205R
IC802	8-759-148-87	CXA8016M
IC803	8-752-334-49	CXD1172AM
IC804	8-759-998-96	LM324D
IC805	8-759-998-96	LM324D

< TRANSISTOR >

Q801	8-729-905-35	2SC4081-R
Q802	8-729-905-35	2SC4081-R
Q806	8-729-905-35	2SC4081-R
Q807	8-729-905-35	2SC4081-R
Q808	8-729-905-35	2SC4081-R
Q809	8-729-402-45	UN5212

AF-54P BOARD

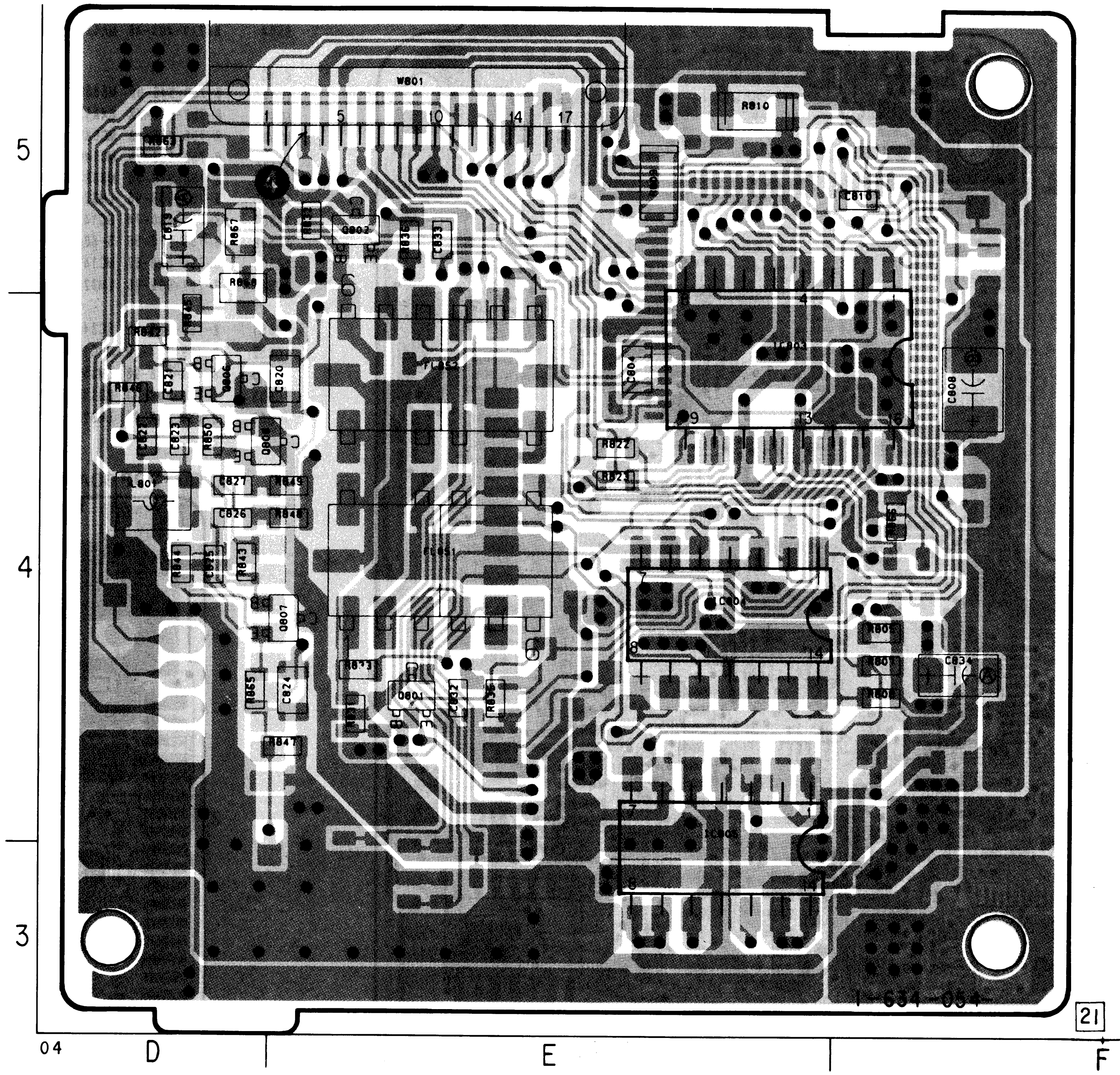


❶
IC801 (9) 4Vp-p (V)
❷
IC801 (10)(11) 0.07Vp-p(V)
❸
IC801 (33) 0.8Vp-p (14.3MHz)
❹
W801 (3) 1.4Vp-p(V)

AF-54P (AUTO FOCUS) PRINTED WIRING BOARD

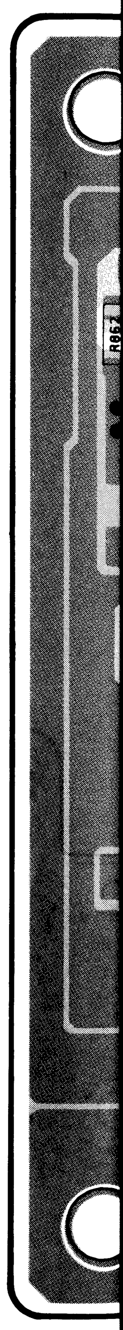
—Ref. No. AF-54P BOARD: 3000 series—

AF-54P BOARD (COMPONENT SIDE)



5
4
3
04
D
E
F
W801
1
5
10
14
17
R810
C810
R867
R868
C813
Q803
C833
C820
C823
C821
R850
C827
C826
R845
R843
R844
Q807
R865
C824
R847
Q801
C802
R836
C804
C808
R822
R823
C834
1-634-054-
21

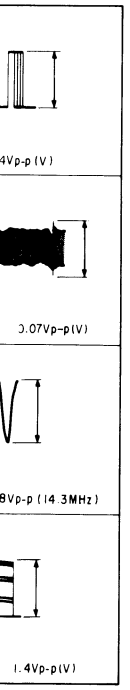
AF-5



MA110

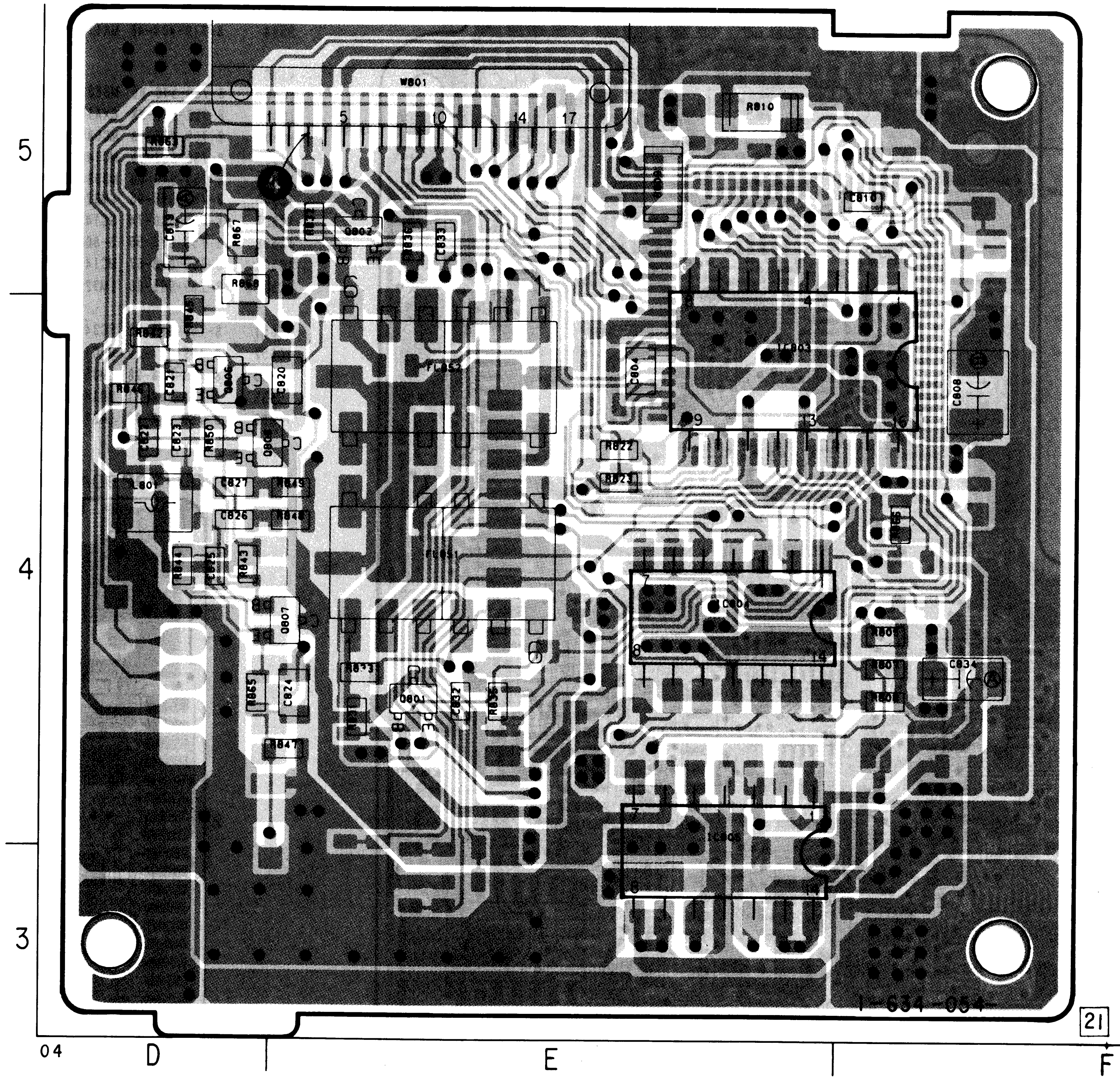
CXD1205R
CXA8016M
CXD1172AM
LM324D
LM324D

2SC4081-R
2SC4081-R
2SC4081-R
2SC4081-R
2SC4081-R
UN5212

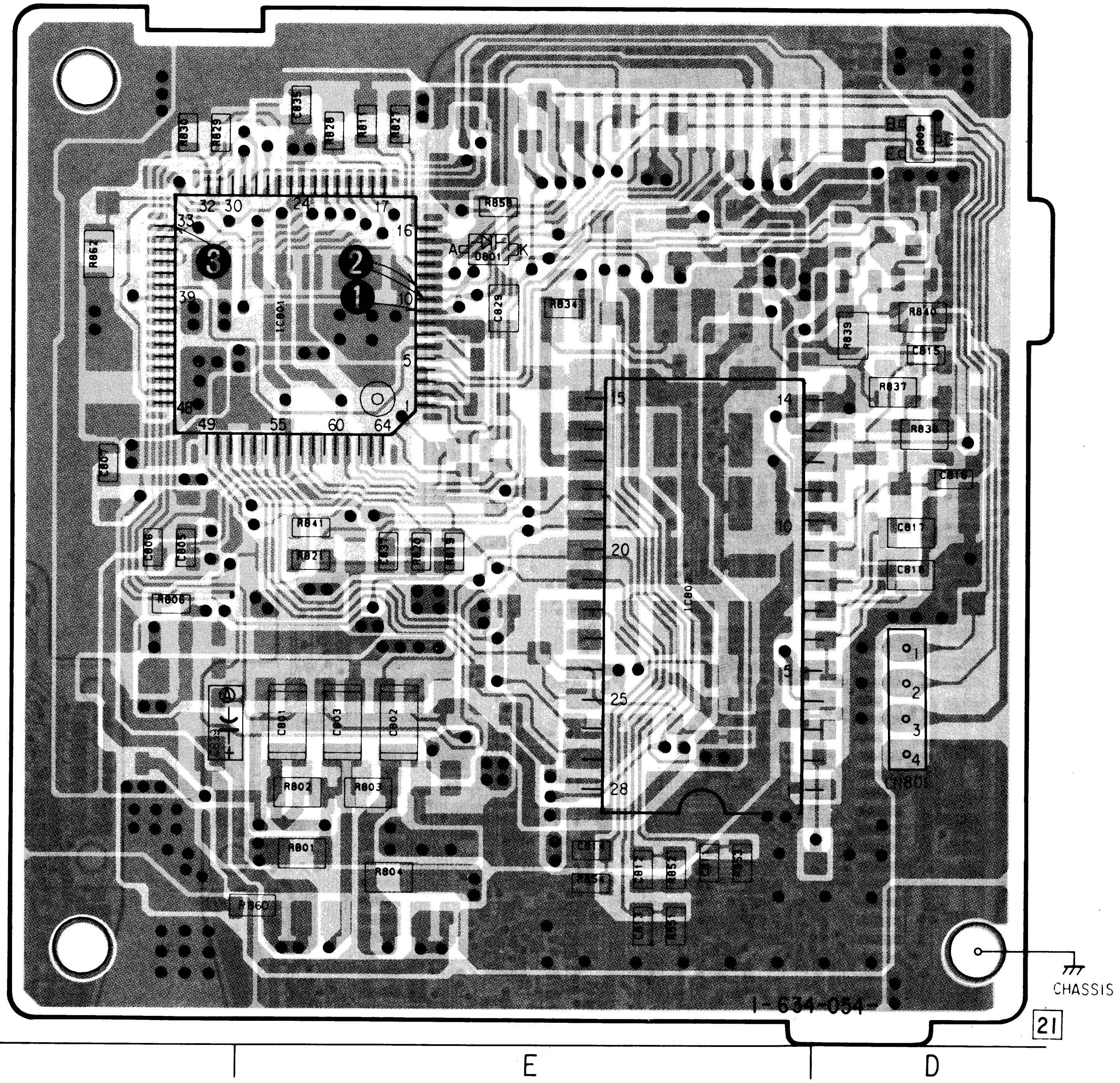


AF-54P (AUTO FOCUS) PRINTED WIRING BOARD
—Ref. No. AF-54P BOARD: 3000 series—

AF-54PBOARD(COMPONENT SIDE)


5
4
3
04
D
E
F
W801
IC803
IC804
IC805
IC806
CN801
1-634-054-
21

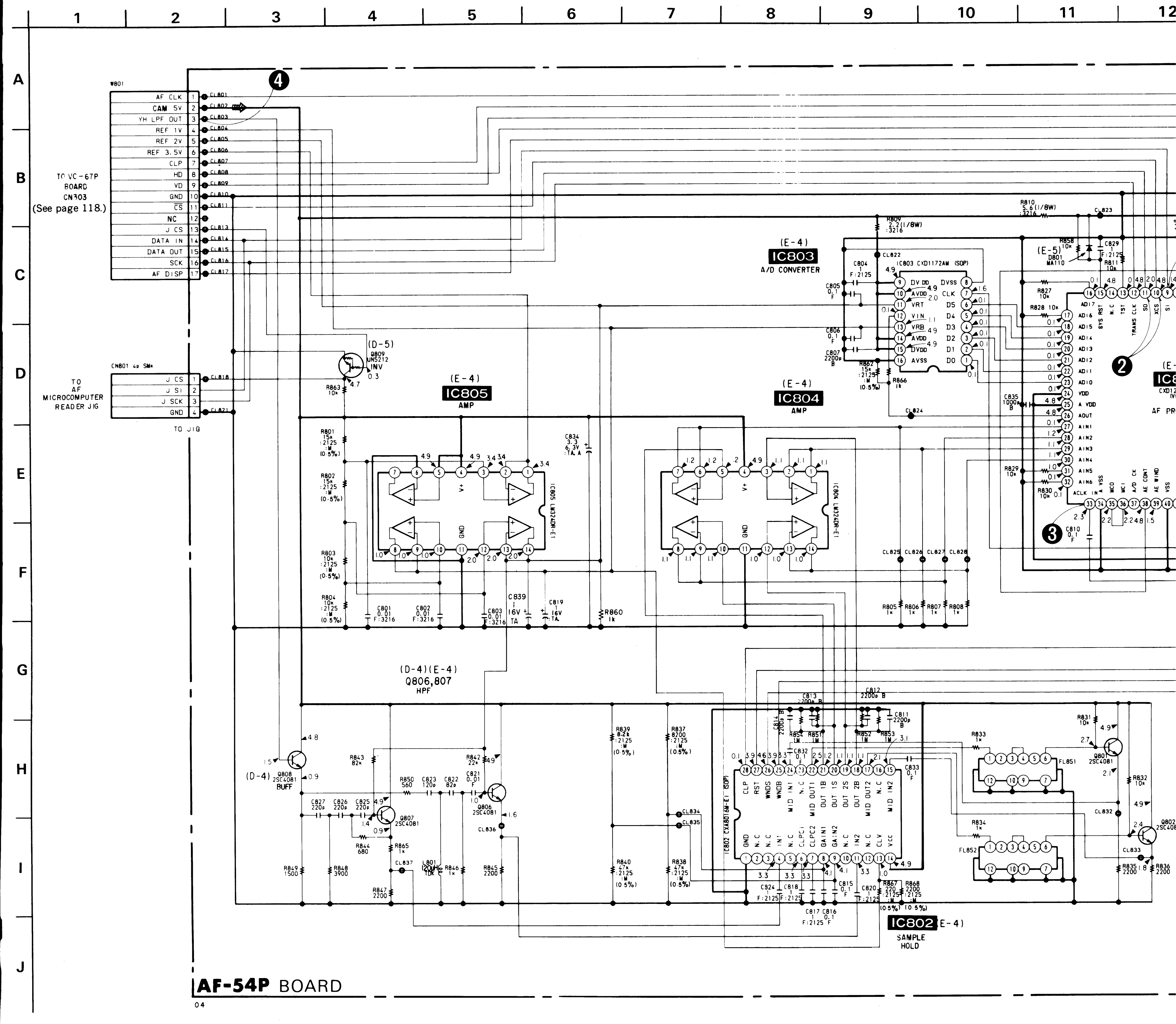
AF-54PBOARD(CONDUCTOR SIDE)

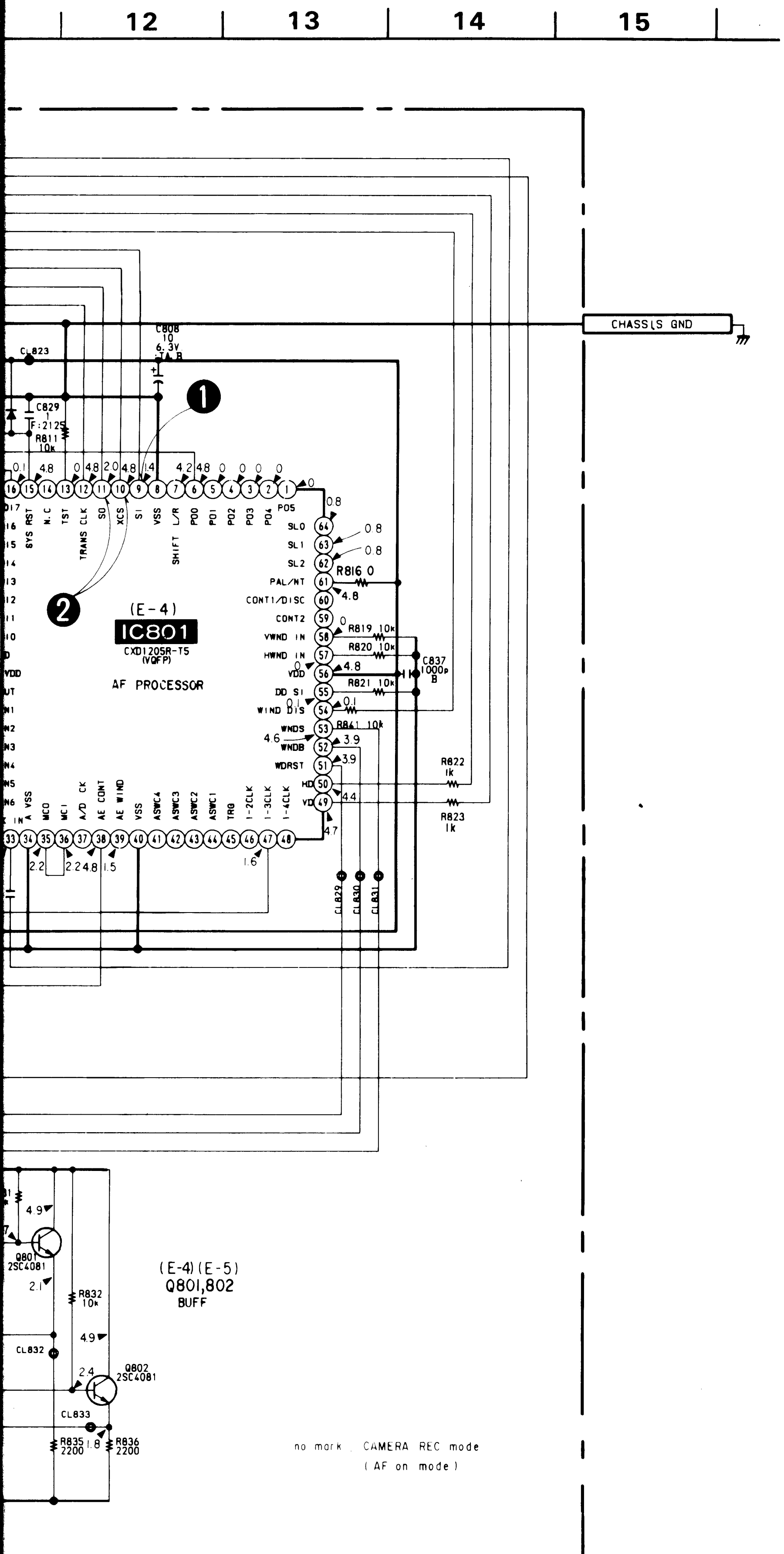

IC801
IC807
D801
CN801
CHASSIS
1-634-054-
21
E
D

AUTO FOCUS AUTO FOCUS

AF-54P (AUTO FOCUS) SCHEMATIC DIAGRAM

—Ref. No. AF-54P BOARD: 3000 series—


1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
W801
AF CLK
CAM 5V
YH LPF OUT
REF 1V
REF 2V
REF 3.5V
CLP
HD
VD
GND
CS
NC
J CS
DATA IN
DATA OUT
SCK
AF DISP
TO VC-67P BOARD CN303 (See page 118.)
CN801 4p SMk
J CS
J SI
J SCK
GND
TO AF MICROCOMPUTER READER JIG
TO JIG
(D-5) Q809 UN5212 INV
(E-4) IC805 AMP
IC805 LM324DR-E1
(E-4) IC804 AMP
IC804 LM324DR-E1
(E-4) IC803 A/D CONVERTER
IC803 CXD1172AM (SOP)
DV DD
AVDD
VRT
VIN
VRB
DVDD
AVSS
DVSS
CLK
D5
D4
D3
D2
D1
D0
(E-5) D801 MA110
AF PR
(D-4)(E-4) Q806,807 HPF
(D-4) Q808 2SC4081 BUFF
Q807 2SC4081
Q806 2SC4081
Q801 2SC4081
Q802 2SC408
FL851
FL852
IC802 CXA1081M-E1 (SOP)
IC802 (E-4) SAMPLE HOLD
CLP
RST
WNDS
WNDB
MID IN1
N.C
MID OUT1
OUT 1B
OUT 1S
OUT 2S
OUT 2B
MID OUT2
N.C
MID IN2
GND
N.C
N.C
IN1
N.C
CLPC1
CLPC2
GAIN1
GAIN2
IN2
N.C
CLV
VCC
AF-54P BOARD
04


12
13
14
15
CHASSIS GND
C808 10 6.3V TA B
CL823
C829 1 F:212S
R811 10k
(E-4)
IC801
CXD1205R-T5 (VQFP)
AF PROCESSOR
SYS RST
N.C
TST
TRANS CLK
SO
XCS
SI
VSS
SHIFT L/R
PO0
PO1
PO2
PO3
PO4
PO5
SL0
SL1
SL2
PAL/NT
CONT1/DISC
CONT2
VWND IN
HWND IN
VDD
DD SI
WIND DIS
WNDS
WNDB
WDRST
HD
VD
R816 0
R819 10k
R820 10k
R821 10k
R841 10k
C837 1000p B
R822 1k
R823 1k
MCO
MCI
A/D CK
AE CONT
AE WIND
ASWC4
ASWC3
ASWC2
ASWC1
TRG
1-2CLK
1-3CLK
1-4CLK
CL829
CL830
CL831
Q801 2SC4081
R832 10k
CL832
Q802 2SC4081
CL833
R835 2200
R836 2200
(E-4) (E-5)
Q801,802
BUFF
no mark : CAMERA REC mode
(AF on mode)

< DIODE >

D001	8-719-941-86	DAN202U
D002	8-719-404-46	MA110
D003	8-719-404-46	MA110
D004	8-719-941-86	DAN202U
D101	8-719-949-46	1T32
D102	8-719-404-46	MA110
D104	8-719-941-86	DAN202U
D201	8-719-801-41	1SS196
D202	8-719-941-86	DAN202U
D203	8-719-941-86	DAN202U
D205	8-719-941-86	DAN202U
D208	8-719-941-86	DAN202U
D210	8-719-941-86	DAN202U
D211	8-719-941-86	DAN202U

< IC >

IC001	8-752-817-79	CXP80116-828Q
IC003	8-759-998-98	LM358D
IC004	8-759-148-05	CXA8010M
IC005	8-759-805-06	CXA1127M
IC006	8-759-990-55	CXA8006M
IC007	8-759-008-95	MC14028BF
IC008	8-759-748-72	BR93C46F
IC101	8-759-970-80	MB673198U
IC102	8-759-148-62	uPD6451GT-630
IC103	8-759-420-01	AN2512S
IC104	8-759-234-20	TC7S08F
IC150	8-752-035-48	CXA1204Q
IC201	8-759-012-00	MC10H116M
IC202	8-759-998-92	LM393D
IC204	8-759-998-32	CXD2107

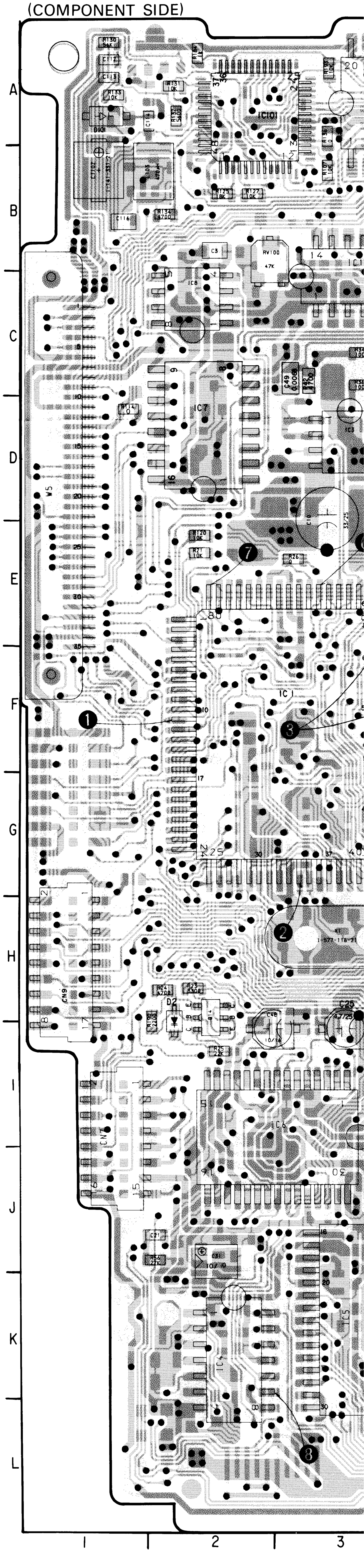
< TRANSISTOR >

Q001	8-729-907-00	DTC114EU
Q002	8-729-905-12	DTA144EU
Q003	8-729-905-18	DTC144EU
Q004	8-729-820-47	2SB1202FAT
Q005	8-729-905-35	2SC4081-R
Q007	8-729-905-35	2SC4081-R
Q008	8-729-905-35	2SC4081-R
Q009	8-729-905-35	2SC4081-R
Q010	8-729-907-03	FMG5
Q011	8-729-905-18	DTC144EU
Q012	8-729-905-18	DTC144EU
Q013	8-729-905-18	DTC144EU
Q014	8-729-822-48	FC101
Q015	8-729-905-35	2SC4081-R
Q016	8-729-905-23	2SA1576-R
Q017	8-729-907-03	FMG5
Q018	8-729-905-18	DTC144EU
Q150	8-729-905-23	2SA1576-R
Q151	8-729-905-18	DTC144EU
Q152	8-729-905-35	2SC4081-R
Q153	8-729-905-23	2SA1576-R
Q201	8-729-905-35	2SC4081-R
Q202	8-729-905-35	2SC4081-R
Q203	8-729-905-35	2SC4081-R
Q208	8-729-216-22	2SA1162
Q209	8-729-905-18	DTC144EU
Q213	8-729-216-22	2SA1162
Q214	8-729-119-76	2SA1175-HFE
Q215	8-729-216-22	2SA1162
Q217	8-729-102-07	2SC2223-F13
Q218	8-729-905-35	2SC4081-R
Q219	8-729-905-35	2SC4081-R
Q221	8-729-905-35	2SC4081-R
Q222	8-729-907-00	DTC114EU
Q223	8-729-905-35	2SC4081-R
Q224	8-729-904-07	FMG2
Q225	8-729-905-45	DTA143EU
Q227	8-729-905-35	2SC4081-R
Q229	8-729-141-48	2SB624-BV345
Q230	8-729-141-48	2SB624-BV345
Q231	8-729-905-18	DTC144EU
Q232	8-729-905-18	DTC144EU
Q238	8-729-117-31	2SC4177-L5
Q239	8-729-905-18	DTC144EU
Q240	8-729-905-18	DTC144EU
Q242	8-729-117-31	2SC4177-L5
Q243	8-729-905-18	DTC144EU
Q244	8-729-140-63	2SA1611-M5M6
Q245	8-729-117-31	2SC4177-L5
Q246	8-729-905-18	DTC144EU
Q247	8-729-905-35	2SC4081-R
Q248	8-729-903-10	FMW1
Q249	8-729-905-18	DTC144EU
Q250	8-729-905-12	DTA144EU
Q251	8-729-905-35	2SC4081-R
Q252	8-729-102-07	2SC2223-F13
Q253	8-729-320-17	2SA1122CD
Q254	8-729-905-35	2SC4081-R
Q255	8-729-904-07	FMG2
Q256	8-729-905-12	DTA144EU
Q257	8-729-905-18	DTC144EU
Q258	8-729-903-10	FMW1
Q259	8-729-905-35	2SC4081-R
Q260	8-729-905-35	2SC4081-R
Q261	8-729-905-23	2SA1576-R
Q262	8-729-905-23	2SA1576-R
Q263	8-729-907-26	IMX1
Q265	8-729-905-35	2SC4081-R
Q266	8-729-905-35	2SC4081-R
Q267	8-729-905-35	2SC4081-R
Q268	8-729-905-23	2SA1576-R
Q269	8-729-907-26	IMX1
Q270	8-729-905-12	DTA144EU
Q272	8-729-922-94	DTC143TU
Q273	8-729-141-48	2SB624-BV345
Q277	8-729-905-35	2SC4081-R
Q278	8-729-905-35	2SC4081-R
Q279	8-729-905-18	DTC144EU
Q280	8-729-905-35	2SC4081-R
Q282	8-729-102-07	2SC2223-F13
Q283	8-729-102-07	2SC2223-F13
Q284	8-729-905-35	2SC4081-R
Q285	8-729-102-07	2SC2223-F13
Q286	8-729-105-68	2SC3356-K
Q287	8-729-924-46	DTC124XU
Q288	8-729-905-12	DTA144EU
Q289	8-729-102-07	2SC2223-F13
Q290	8-729-102-07	2SC2223-F13
Q291	8-729-907-26	IMX1
Q292	8-729-905-12	DTA144EU
Q294	8-729-905-18	DTC144EU
Q295	8-729-905-35	2SC4081-R

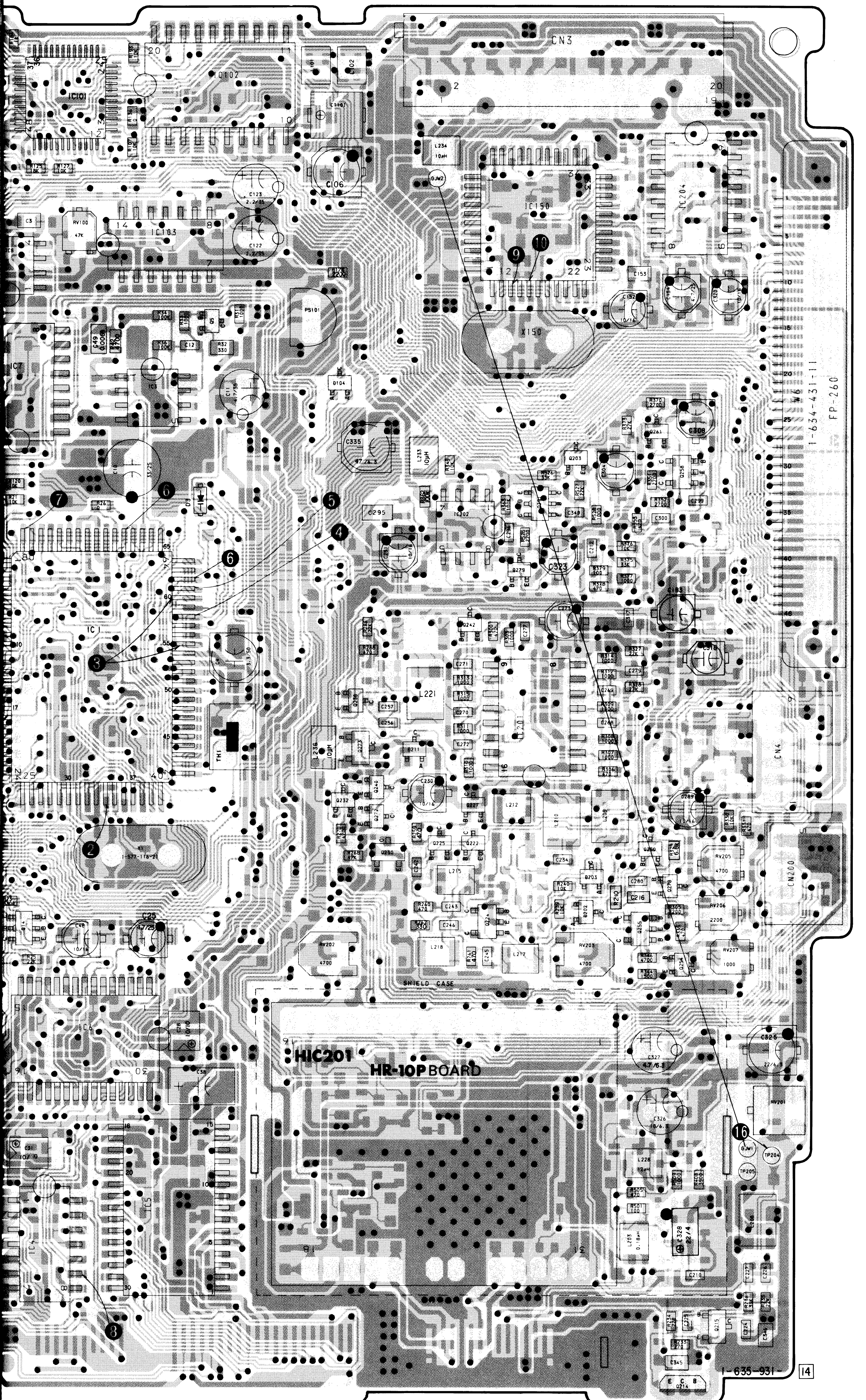
SS-133 (SERVO, SYSTEM CONTROL, REC/PB AM

—Ref. No. SS-133 BOARD: 2000 series—

SS-133 BOARD
(COMPONENT SIDE)



M CONTROL, REC/PB AMP) PRINTED WIRING BOARD
D : 2000 series—


CN3
IC101
IC102
IC103
IC106
IC150
IC204
IC202
IC201
X150
PS101
RV100
TH1
L221
L233
L234
L236
CN4
CN200
RV201
RV202
RV203
RV205
RV206
RV207
C335
C323
C325
C326
C327
C328
SHIELD CASE
HIC201
HR-10P BOARD
1-634-431-11
FP-260
1-633-931-
14
2
3
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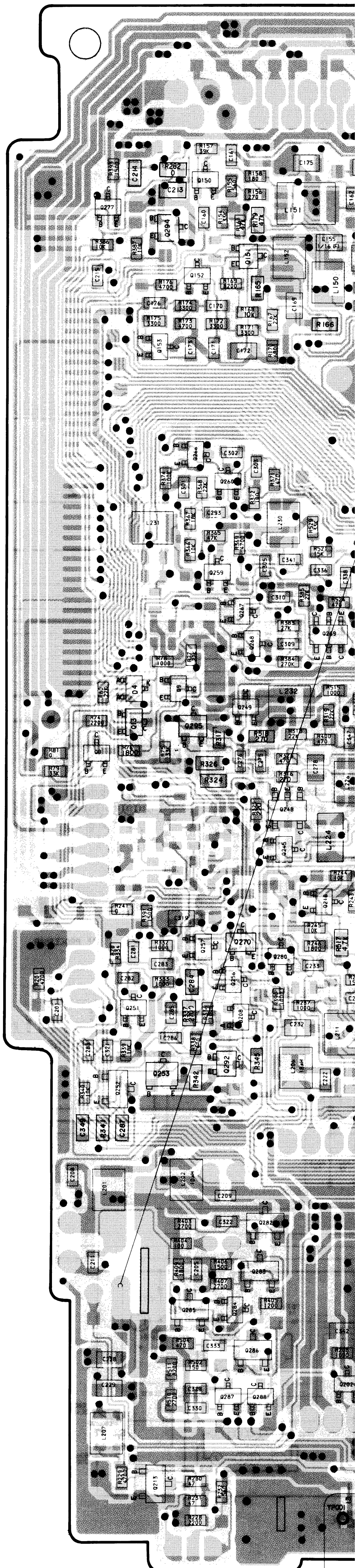
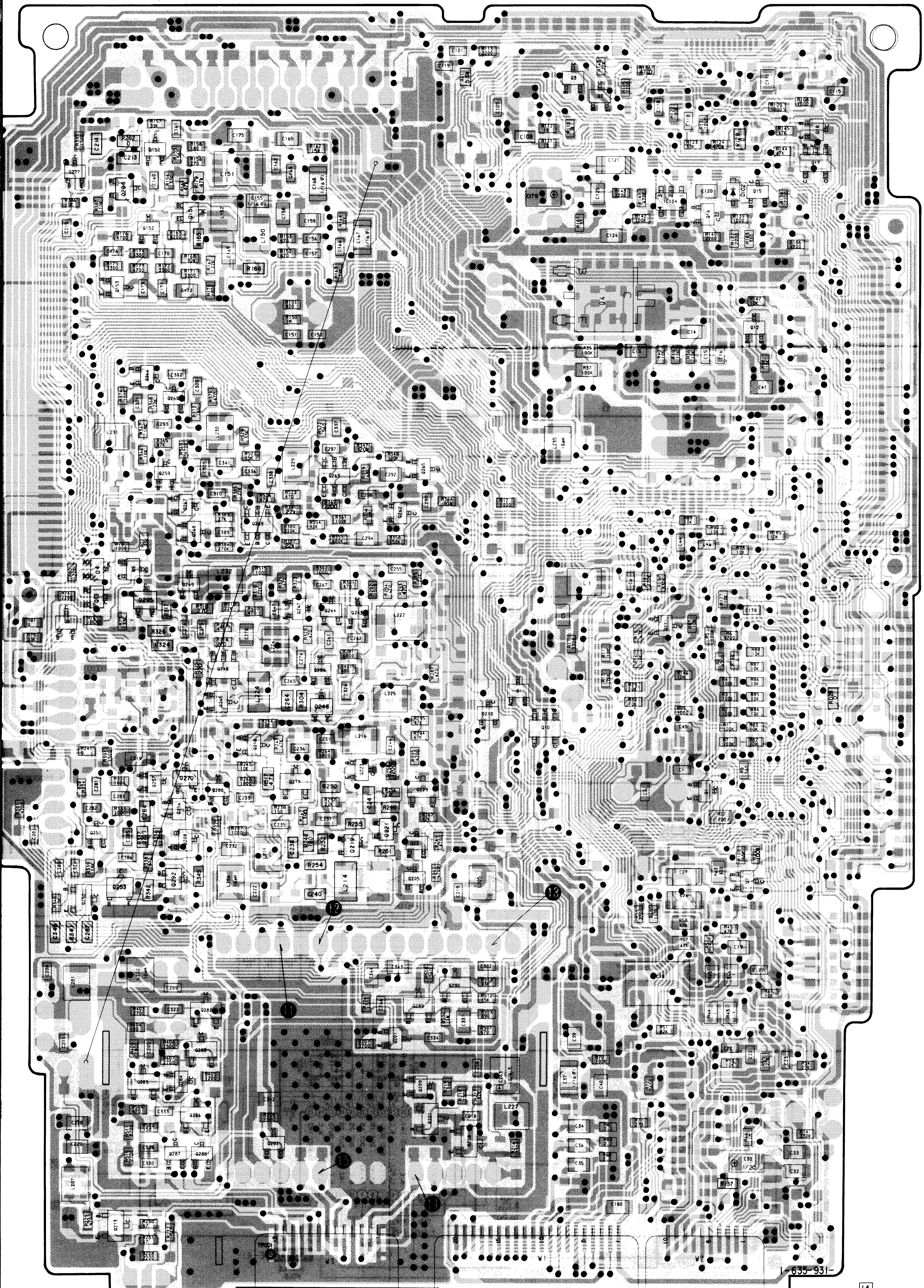
9

SS-133 BOARD
(CONDUCTOR SIDE)

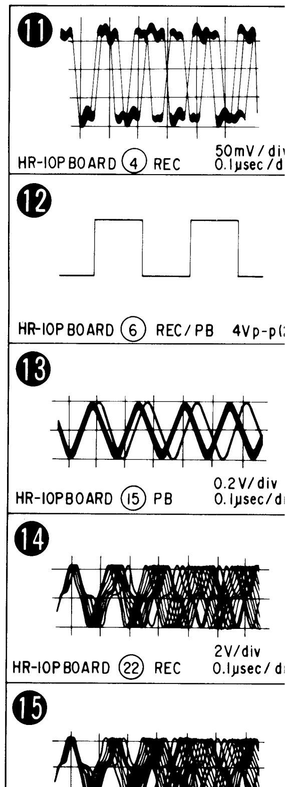

Q150
Q152
L150
L151
L231
L232
Q270
Q253
Q286
Q287
Q288
10
11

SS-133 BOARD
(CONDUCTOR SIDE)



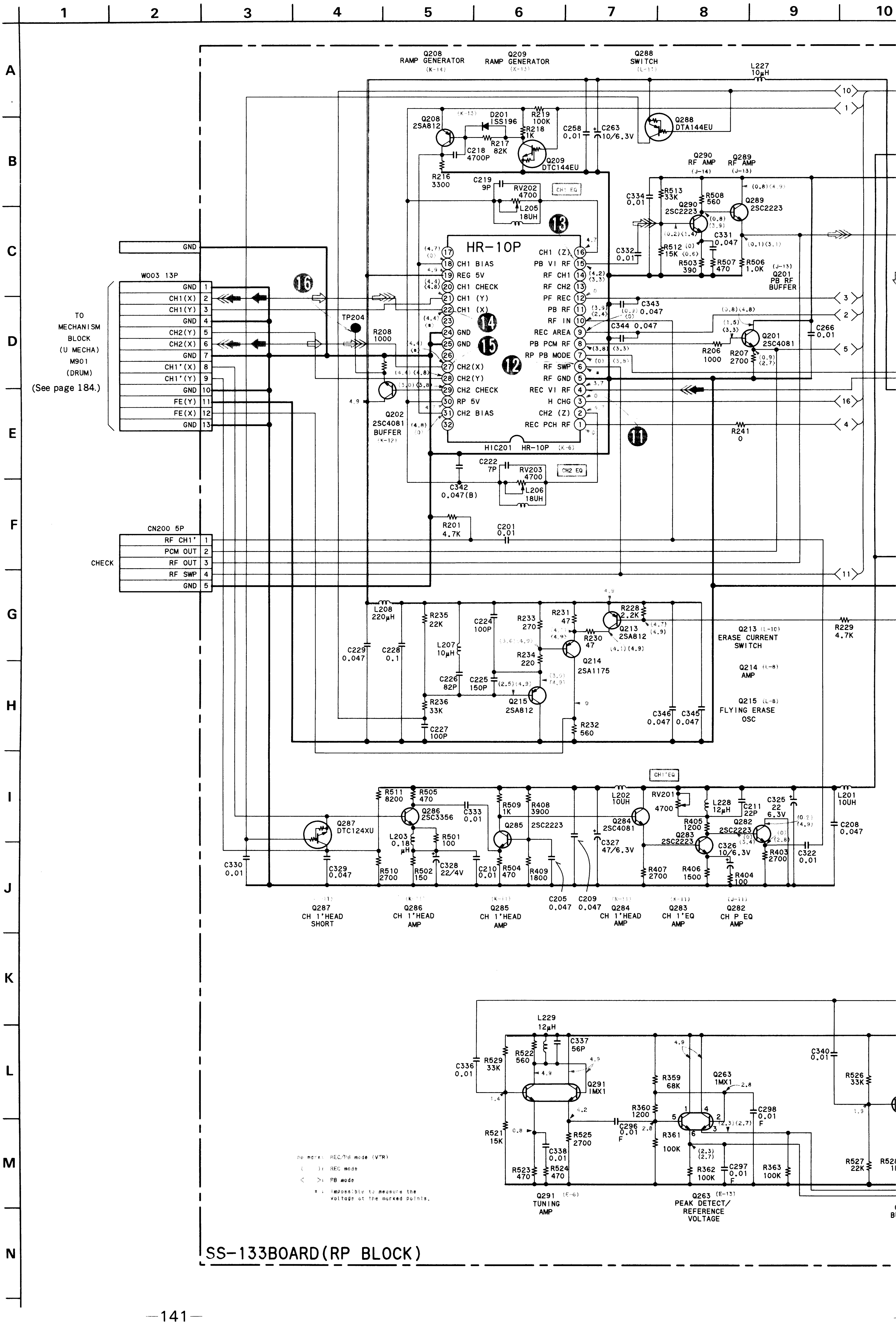
⑪
⑫
⑬
⑭
⑮
⑯
W1
W2
1-635-931-
14
10
11
12
13
14
15
16
17

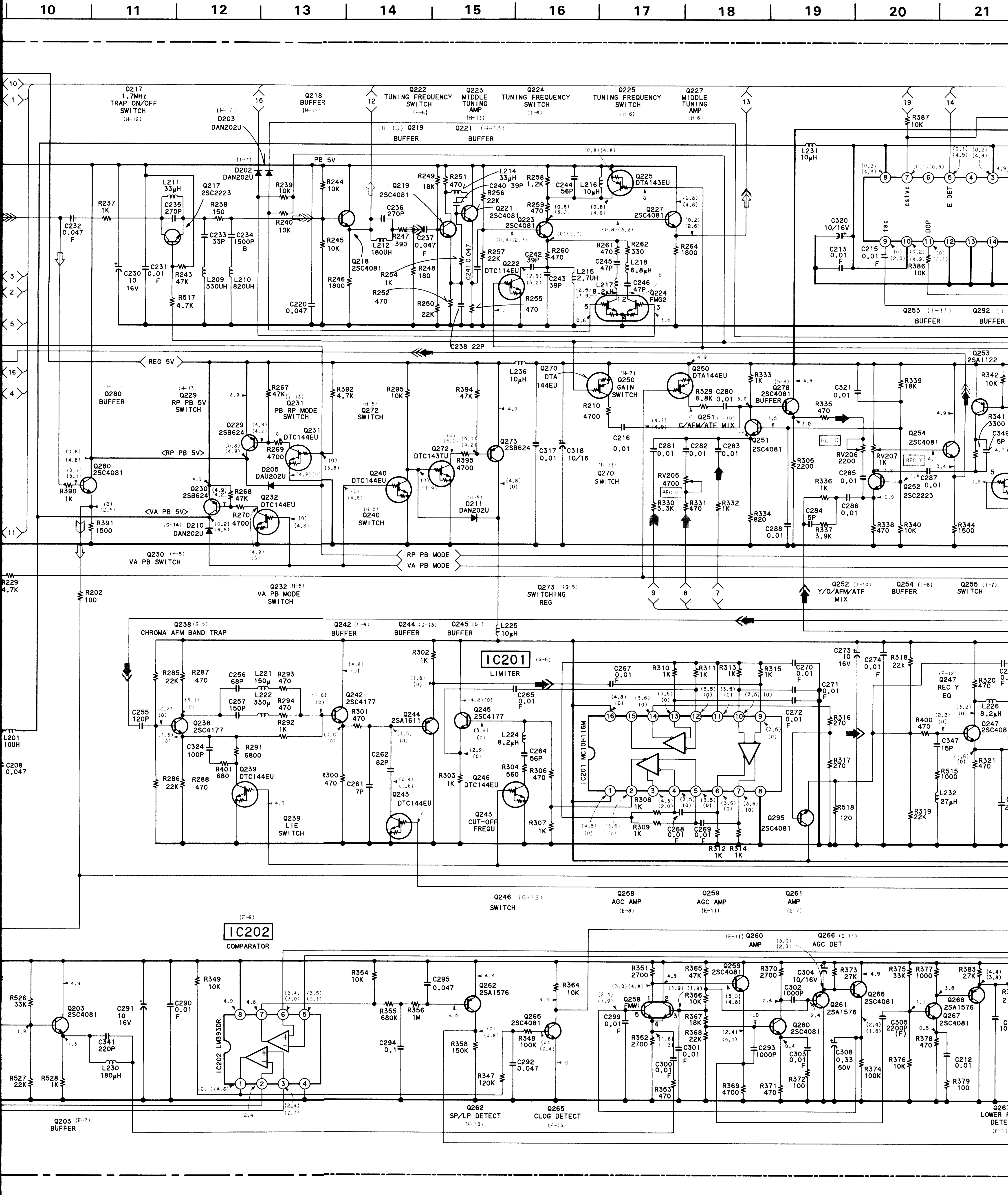
SS-133 BOARD (RP BLOCK)



SS-133 (SERVO, SYSTEM CONTROL, REC/PB AMP) SCHEMATIC DIAGRAM

—Ref. No. SS-133 BOARD: 2000 series—


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
H
I
J
K
L
M
N
Q208 RAMP GENERATOR (K-14)
Q209 RAMP GENERATOR (K-13)
Q288 SWITCH (L-11)
L227 10μH
Q208 2SA812
D201 1SS196
R219 100K
R218 1K
R217 82K
C218 4700P
Q209 DTC144EU
C258 0.01
C263 10/6.3V
Q288 DTA144EU
R216 3300
C219 9P
RV202 4700
L205 18UH
CH1 EQ
Q290 RF AMP (J-14)
Q289 RF AMP (J-13)
C334 0.01
R513 33K
R508 560
Q290 2SC2223
Q289 2SC2223
C331 0.047
C332 0.01
R512 15K
R503 390
R507 470
R506 1.0K
Q201 PB RF BUFFER (J-13)
GND
W003 13P
GND 1
CH1(X) 2
CH1(Y) 3
GND 4
CH2(Y) 5
CH2(X) 6
GND 7
CH1'(X) 8
CH1'(Y) 9
GND 10
FE(Y) 11
FE(X) 12
GND 13
TO MECHANISM BLOCK (U MECHA) M901 (DRUM)
(See page 184.)
TP204
R208 1000
Q202 2SC4081 BUFFER (K-12)
HR-10P
17
18 CH1 BIAS
19 REG 5V
20 CH1 CHECK
21 CH1 (Y)
22 CH1 (X)
23
24 GND
25 GND
26
27 CH2(X)
28 CH2(Y)
29 CH2 CHECK
30 RP 5V
31 CH2 BIAS
32
CH1 (Z) 16
PB VI RF 15
RF CH1 14
RF CH2 13
PF REC 12
PB RF 11
RF IN 10
REC AREA 9
PB PCM RF 8
RP PB MODE 7
RF SWP 6
RF GND 5
REC VI RF 4
H CHG 3
CH2 (Z) 2
REC PCH RF 1
HIC201 HR-10P (K-6)
C343 0.047
C344 0.047
R206 1000
R207 2700
Q201 2SC4081
C266 0.01
R241 0
C222 7P
RV203 4700
CH2 EQ
L206 18UH
C342 0.047(B)
R201 4.7K
C201 0.01
CN200 5P
CHECK
RF CH1' 1
PCM OUT 2
RF OUT 3
RF SWP 4
GND 5
L208 220μH
R235 22K
C224 100P
R233 270
R231 47
R228 2.2K
Q213 2SA812
R230 47
Q214 2SA1175
R234 220
L207 10μH
C229 0.047
C228 0.1
C226 82P
C225 150P
Q215 2SA812
R236 33K
C227 100P
R232 560
C346 0.047
C345 0.047
Q213 (L-10) ERASE CURRENT SWITCH
Q214 (L-8) AMP
Q215 (L-8) FLYING ERASE OSC
R229 4.7K
CH1'EQ
R511 8200
R505 470
Q286 2SC3356
C333 0.01
R509 1K
R408 3900
Q285 2SC2223
L202 10UH
RV201 4700
L228 12μH
C211 22P
C325 22 6.3V
L201 10UH
C208 0.047
Q287 DTC124XU
L203 0.18μH
R501 100
C328 22/4V
Q284 2SC4081
R405 1200
Q282 2SC2223
Q283 2SC2223
C327 47/6.3V
C326 10/6.3V
R403 2700
C322 0.01
C330 0.01
C329 0.047
R510 2700
R502 150
C210 0.01
R504 470
R409 1800
R407 2700
R406 1500
R404 100
C205 0.047
C209 0.047
Q287 CH 1'HEAD SHORT
Q286 CH 1'HEAD AMP
Q285 CH 1'HEAD AMP
Q284 CH 1'HEAD AMP
Q283 CH 1'EQ AMP
Q282 CH P EQ AMP
L229 12μH
C337 56P
R522 560
R529 33K
C336 0.01
Q291 1MX1
R521 15K
R525 2700
C338 0.01
R523 470
R524 470
Q291 (F-6) TUNING AMP
R359 68K
Q263 1MX1
R360 1200
C296 0.01 F
R361 100K
C298 0.01 F
R362 100K
C297 0.01 F
R363 100K
Q263 (E-13) PEAK DETECT/ REFERENCE VOLTAGE
C340 0.01
R526 33K
R527 22K
No mark: REC/PB mode (VTR)
( ): REC mode
< >: PB mode
*: Impossible to measure the voltage at the marked points.
SS-133BOARD(RP BLOCK)


10
11
12
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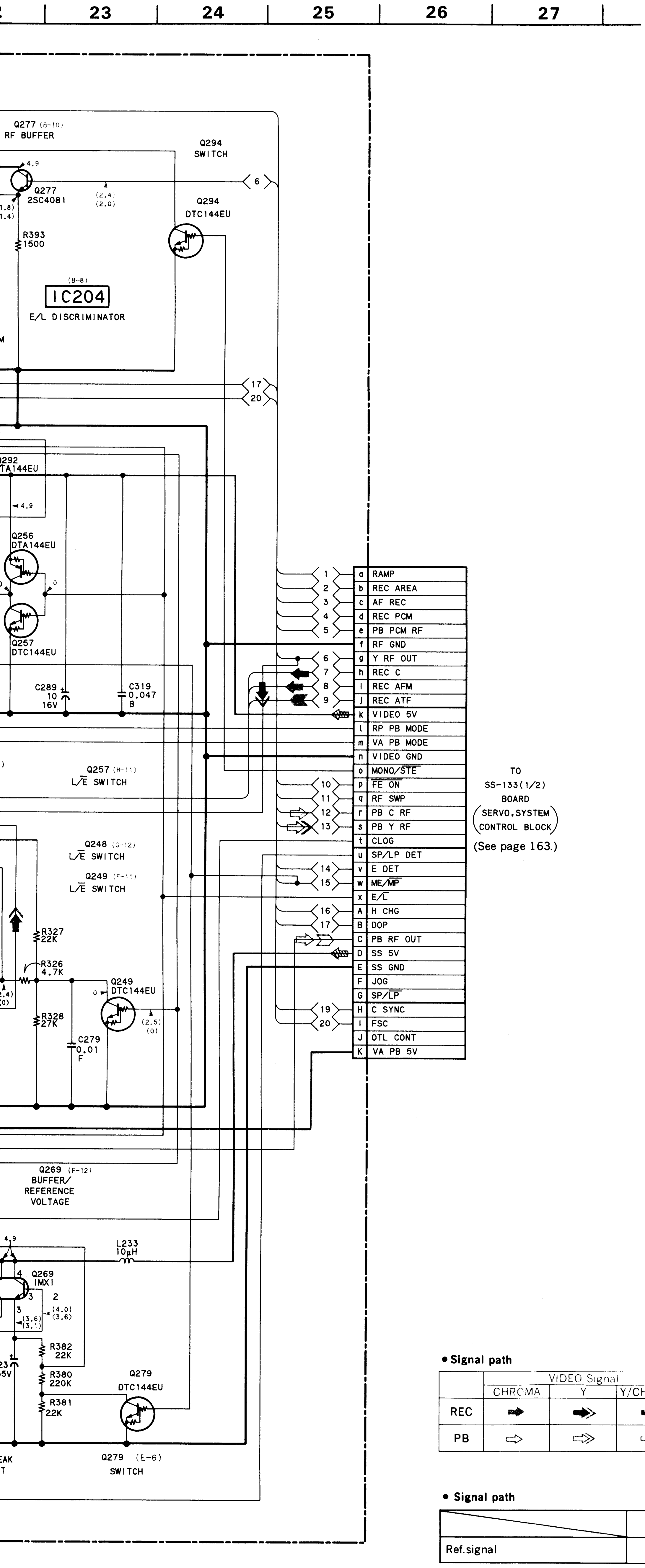
14
15
16
17
18
19
20
21
Q217 1.7MHz TRAP ON/OFF SWITCH
Q218 BUFFER
Q222 TUNING FREQUENCY SWITCH
Q223 MIDDLE TUNING AMP
Q224 TUNING FREQUENCY SWITCH
Q225 TUNING FREQUENCY SWITCH
Q227 MIDDLE TUNING AMP
Q219 BUFFER
Q221 BUFFER
D203 DAN202U
D202 DAN202U
PB 5V
Q217 2SC2223
Q219 2SC4081
Q221 2SC4081
Q223 2SC4081
Q225 DTA143EU
Q227 2SC4081
Q218 2SC4081
Q222 DTC114EU
Q224 FMG2
REG 5V
Q280 BUFFER
Q229 RP PB 5V SWITCH
Q231 PB RP MODE SWITCH
Q272 SWITCH
Q229 2SB624
Q231 DTC144EU
D205 DAU202U
Q280 2SC4081
<RP PB 5V>
Q230 2SB624
Q232 DTC144EU
<VA PB 5V>
D210 DAN202U
Q240 DTC144EU
Q240 SWITCH
Q272 DTC143TU
Q273 2SB624
D211 DAN202U
Q270 DTA 144EU
Q250 GAIN SWITCH
Q250 DTA144EU
Q278 BUFFER
Q251 C/AFM/ATF MIX
Q251 2SC4081
Q270 SWITCH
Q254 2SC4081
Q252 2SC2223
REC C
REC Y
RP PB MODE
VA PB MODE
Q230 VA PB SWITCH
Q232 VA PB MODE SWITCH
Q273 SWITCHING REG
Q252 Y/O/AFM/ATF MIX
Q254 BUFFER
Q255 SWITCH
Q253 BUFFER
Q292 BUFFER
Q253 2SA1122
Q238 CHROMA AFM BAND TRAP
Q242 BUFFER
Q244 BUFFER
Q245 BUFFER
IC201 LIMITER
Q238 2SC4177
Q242 2SC4177
Q244 2SA1611
Q245 2SC4177
Q239 DTC144EU
Q239 LIE SWITCH
Q243 DTC144EU
Q246 DTC144EU
Q243 CUT-OFF FREQU
IC201 MC10H116M
Q295 2SC4081
Q247 REC Y EQ
Q247 2SC408
Q246 SWITCH
Q258 AGC AMP
Q259 AGC AMP
Q261 AMP
IC202 COMPARATOR
IC202 LM393DR
Q203 2SC4081
Q262 2SA1576
Q265 2SC4081
Q262 SP/LP DETECT
Q265 CLOG DETECT
Q203 BUFFER
Q260 AMP
Q266 AGC DET
Q258 EMW1
Q259 2SC4081
Q260 2SC4081
Q261 2SA1576
Q266 2SC4081
Q268 2SA1576
Q267 2SC4081
Q267 LOWER DETE


23
24
25
26
27
Q277 (B-10)
RF BUFFER
Q294
SWITCH
4.9
Q277
2SC4081
(2.4)
(2.0)
Q294
DTC144EU
(1.8)
(1.4)
R393
1500
(B-8)
IC204
E/L DISCRIMINATOR
6
17
20
Q292
DTA144EU
4.9
Q256
DTA144EU
0
Q257
DTC144EU
C289
10
16V
C319
0.047
B
Q257 (H-11)
L/E SWITCH
Q248 (G-12)
L/E SWITCH
Q249 (F-11)
L/E SWITCH
R327
22K
R326
4.7K
Q249
DTC144EU
R328
27K
C279
0.01
F
(2.5)
(0)
Q269 (F-12)
BUFFER/
REFERENCE
VOLTAGE
4.9
L233
10μH
Q269
IMX1
(4.0)
(3.6)
(3.6)
(3.1)
R382
22K
R380
220K
R381
22K
Q279
DTC144EU
Q279 (E-6)
SWITCH
1 a RAMP
2 b REC AREA
3 c AF REC
4 d REC PCM
5 e PB PCM RF
f RF GND
6 g Y RF OUT
7 h REC C
8 i REC AFM
9 j REC ATF
k VIDEO 5V
l RP PB MODE
m VA PB MODE
n VIDEO GND
o MONO/STE
10 p FE ON
11 q RF SWP
12 r PB C RF
13 s PB Y RF
t CLOG
u SP/LP DET
14 v E DET
15 w ME/MP
x E/L
16 A H CHG
17 B DOP
C PB RF OUT
D SS 5V
E SS GND
F JOG
G SP/LP
19 H C SYNC
20 I FSC
J OTL CONT
K VA PB 5V
TO
SS-133(1/2)
BOARD
(SERVO,SYSTEM
CONTROL BLOCK)
(See page 163.)

• Signal path

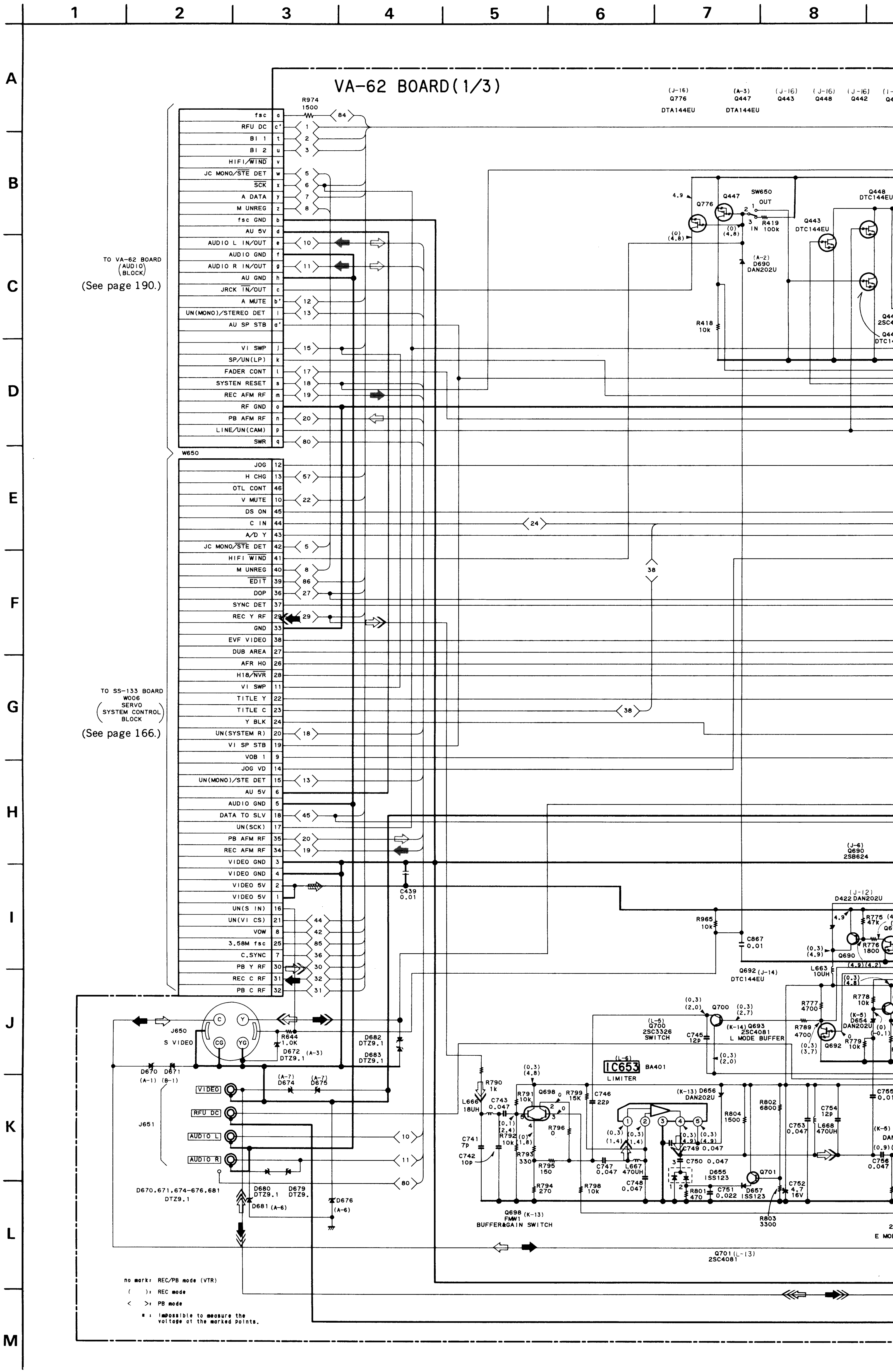
	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨

• Signal path

	REC	REC/PB	PB
Ref.signal	➤	➢	▷

VA-62 (Y/CHROMA SIGNAL PROCESS, AUDIO SIGNAL PROCESS) SCHEMATIC DIAGRAM

—Ref. No. VA-62 BOARD: 1000 series—



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A
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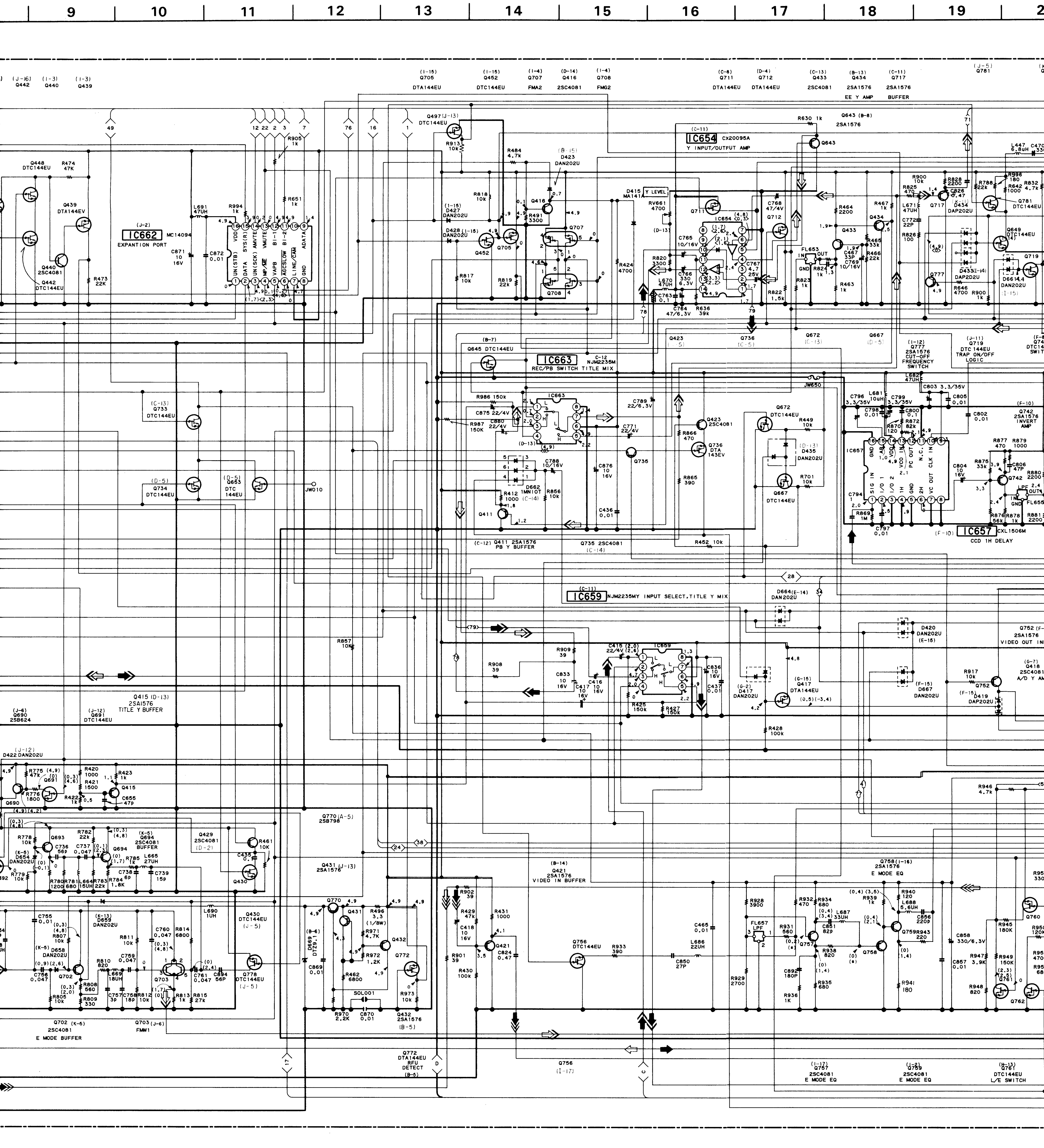
C
D
E
F
G
H
I
J
K
L
M
VA-62 BOARD(1/3)
TO VA-62 BOARD (AUDIO BLOCK)
(See page 190.)
TO SS-133 BOARD W006 (SERVO SYSTEM CONTROL BLOCK)
(See page 166.)
W650
fsc
RFU DC
BI 1
BI 2
HIFI/WIND
JC MONO/STE DET
SCK
A DATA
M UNREG
fsc GND
AU 5V
AUDIO L IN/OUT
AUDIO GND
AUDIO R IN/OUT
AU GND
JRCK IN/OUT
A MUTE
UN(MONO)/STEREO DET
AU SP STB
VI SWP
SP/UN(LP)
FADER CONT
SYSTEN RESET
REC AFM RF
RF GND
PB AFM RF
LINE/UN(CAM)
SWR
JOG
H CHG
OTL CONT
V MUTE
DS ON
C IN
A/D Y
JC MONO/STE DET
HIFI WIND
M UNREG
EDIT
DOP
SYNC DET
REC Y RF
GND
EVF VIDEO
DUB AREA
AFR HO
H18/NVR
VI SWP
TITLE Y
TITLE C
Y BLK
UN(SYSTEM R)
VI SP STB
VOB 1
JOG VD
UN(MONO)/STE DET
AU 5V
AUDIO GND
DATA TO SLV
UN(SCK)
PB AFM RF
REC AFM RF
VIDEO GND
VIDEO GND
VIDEO 5V
VIDEO 5V
UN(S IN)
UN(VI CS)
VOW
3.58M fsc
C.SYNC
PB Y RF
REC C RF
PB C RF
R974 1500
Q776 DTA144EU
Q447 DTA144EU
Q443
Q448
Q442
SW650 OUT IN
R419 100k
Q443 DTC144EU
Q448 DTC144EU
D690 DAN202U
R418 10k
C439 0.01
J650 S VIDEO
R644 1.0K
D672 DTZ9.1
D682 DTZ9.1
D683 DTZ9.1
D670 D671
D674 D675
J651
VIDEO
RFU DC
AUDIO L
AUDIO R
D670,671,674-676,681 DTZ9.1
D680 DTZ9.1
D679 DTZ9.
D681
D676
Q690 2SB624
D422 DAN202U
R965 10k
C867 0.01
R775 47k
R776 1800
L663 10UH
Q692 DTC144EU
Q700 2SC3326 SWITCH
Q693 2SC4081 L MODE BUFFER
R777 4700
R778 10k
D654 DAN202U
R789 4700
R779 10k
IC653 BA401 LIMITER
R790 1k
L666 18UH
C743 0.047
R791 10k
Q698
R799 15K
C746 22p
D656 DAN202U
R804 1500
R802 6800
C754 12p
C753 0.047
L668 470UH
C755 0.01
C741 7P
C742 10p
R792 10k
R793 330
R796 0
R795 150
R794 270
R798 10k
C747 0.047
L667 470UH
C748 0.047
C749 0.047
C750 0.047
D655 1SS123
R801 470
C751 0.022
D657 1SS123
Q701
C752 4.7 16V
R803 3300
C756 0.047
C745 12p
Q698 FMW1 BUFFER&GAIN SWITCH
Q701 2SC4081
E MODE
no mark: REC/PB mode (VTR)
( ): REC mode
< >: PB mode
*: Impossible to measure the voltage at the marked points.

• **Signal path**

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨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14
15
16
17
18
19
Q442
Q440
Q439
Q705 DTA144EU
Q452 DTC144EU
Q707 FMA2
Q416 2SC4081
Q708 FMG2
Q711 DTA144EU
Q712 DTA144EU
Q433 2SC4081
Q434 2SA1576 EE Y AMP
Q717 2SA1576 BUFFER
Q781
Q448 DTC144EU
R474 47K
Q439 DTA144EV
Q440 2SC4081
Q442 DTC144EU
IC662 MC14094
EXPANTION PORT
Q497 DTC144EU
IC654 CX20095A
Y INPUT/OUTPUT AMP
Q643 2SA1576
D423 DAN202U
D427 DAN202U
D428 DAN202U
D415 MA141A
Y LEVEL
RV661 4700
FL653
Q645 DTC144EU
IC663 NJM2235M
REC/PB SWITCH TITLE MIX
Q777 2SA1576 CUT-OFF FREQUENCY SWITCH
Q719 DTC 144EU TRAP ON/OFF LOGIC
Q742 2SA1576 INVERT AMP
JW650
Q733 DTC144EU
Q734 DTC144EU
Q653 DTC 144EU
JW010
Q423 2SC4081
Q736 DTA 143EV
Q672 DTC144EU
D435 DAN202U
Q667 DTC144EU
Q411 2SA1576 PB Y BUFFER
Q735 2SC4081
IC657 CXL1506M
CCD 1H DELAY
FL655
IC659 NJM2235MY INPUT SELECT.TITLE Y MIX
D664 DAN202U
D420 DAN202U
Q752 2SA1576 VIDEO OUT
Q418 2SC4081 A/D Y
D417 DAN202U
Q417 DTA144EU
D667 DAN202U
D419 DAP202U
Q415 2SA1576 TITLE Y BUFFER
Q690 2SB624
Q691 DTC144EU
D422 DAN202U
Q694 2SC4081 BUFFER
Q770 2SB798
Q429 2SC4081
Q431 2SA1576
Q421 2SA1576 VIDEO IN BUFFER
D654 DAN202U
D658 DAN202U
D659 DAN202U
Q702 2SC4081 E MODE BUFFER
Q703 FMW1
Q430 DTC144EU
Q778 DTC144EU
SOL001
Q772 DTA144EU RFU DETECT
Q432 2SA1576
Q756 DTC144EU
FL657 LPF
Q757 2SC4081 E MODE EQ
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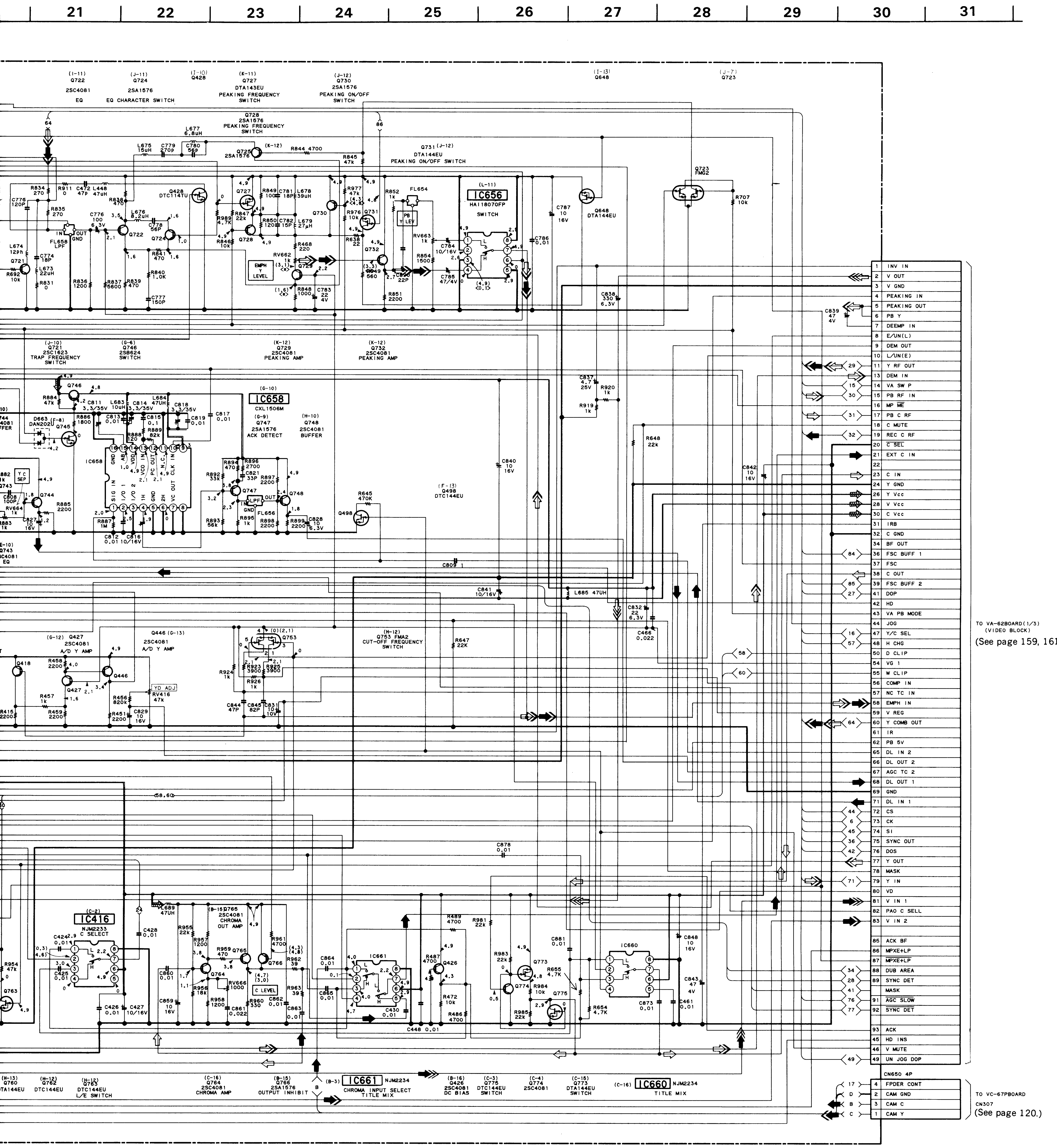
Q760
Q761 DTC144EU L/E SWITCH
Q762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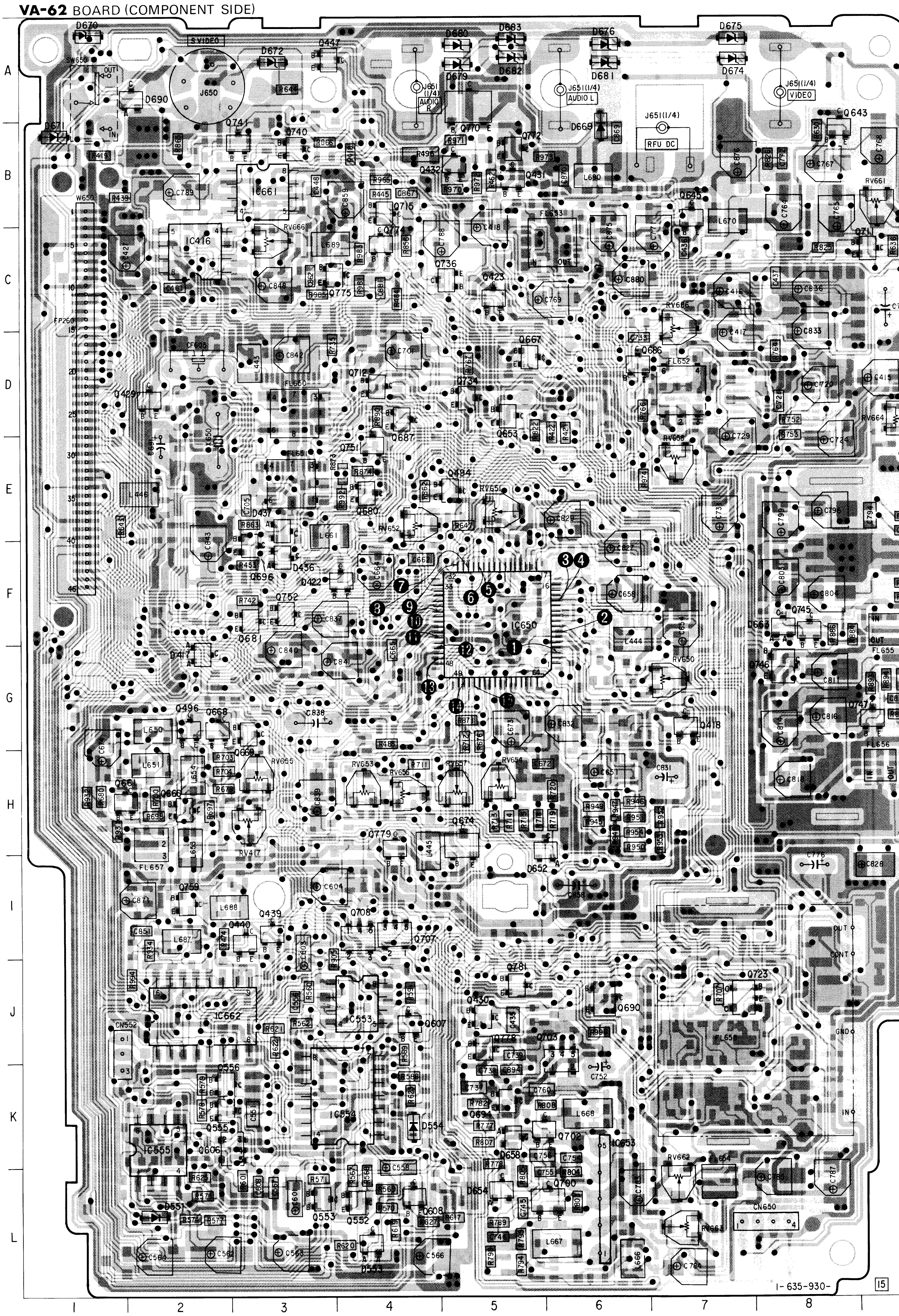
31
(I-11) Q722 2SC4081 EQ
(J-11) Q724 2SA1576 EQ CHARACTER SWITCH
(I-10) Q428
(K-11) Q727 DTA143EU PEAKING FREQUENCY SWITCH
(J-12) Q730 2SA1576 PEAKING ON/OFF SWITCH
(I-13) Q648
(J-7) Q723
Q728 2SA1576 PEAKING FREQUENCY SWITCH
Q731 (J-12) DTA144EU PEAKING ON/OFF SWITCH
(L-11) IC656 HA118070FP SWITCH
Q723 FMG2
Q648 DTA144EU
EMPH Y LEVEL
PB Y LEV
FL654
FL658 LPF
(J-10) Q721 2SC1623 TRAP FREQUENCY SWITCH
(G-6) Q746 2SB624 SWITCH
(K-12) Q729 2SC4081 PEAKING AMP
(K-12) Q732 2SC4081 PEAKING AMP
(G-10) IC658 CXL1506M
(G-9) Q747 2SA1576 ACK DETECT
(H-10) Q748 2SC4081 BUFFER
(F-13) Q498 DTC144EU
Y C SEP
(G-12) Q427 2SC4081 A/D Y AMP
Q446 (G-13) 2SC4081 A/D Y AMP
YD ADJ
(H-12) Q753 FMA2 CUT-OFF FREQUENCY SWITCH
(C-2) IC416 NJM2233 C SELECT
(B-15) Q765 2SC4081 CHROMA OUT AMP
C LEVEL
IC661
IC660
(H-13) Q760 DTA144EU
(H-12) Q762 DTC144EU
(H-12) Q763 DTC144EU L/E SWITCH
(C-16) Q764 2SC4081 CHROMA AMP
(B-15) Q766 2SA1576 OUTPUT INHIBIT
(B-3) IC661 NJM2234 CHROMA INPUT SELECT TITLE MIX
(B-16) Q426 2SC4081 DC BIAS
(C-3) Q775 DTC144EU SWITCH
(C-4) Q774 2SC4081
(C-15) Q773 DTA144EU SWITCH
(C-16) IC660 NJM2234 TITLE MIX
1 INV IN
2 V OUT
3 V GND
4 PEAKING IN
5 PEAKING OUT
6 PB Y
7 DEEMP IN
8 E/UN(L)
9 DEM OUT
10 L/UN(E)
11 Y RF OUT
13 DEM IN
14 VA SW P
15 PB RF IN
16 MP ME
17 PB C RF
18 C MUTE
19 REC C RF
20 C SEL
21 EXT C IN
22
23 C IN
24 Y GND
26 Y Vcc
28 V Vcc
30 C Vcc
31 IRB
32 C GND
34 BF OUT
36 FSC BUFF 1
37 FSC
38 C OUT
39 FSC BUFF 2
41 DOP
42 HD
43 VA PB MODE
44 JOG
47 Y/C SEL
48 H CHG
50 D CLIP
54 VG 1
55 W CLIP
56 COMP IN
57 NC TC IN
58 EMPH IN
59 V REG
60 Y COMB OUT
61 IR
62 PB 5V
65 DL IN 2
66 DL OUT 2
67 AGC TC 2
68 DL OUT 1
69 GND
71 DL IN 1
72 CS
73 CK
74 SI
75 SYNC OUT
76 DOS
77 Y OUT
78 MASK
79 Y IN
80 VD
81 V IN 1
82 PAO C SELL
83 V IN 2
85 ACK BF
86 MPXE+LP
87 MPXE+LP
88 DUB AREA
89 SYNC DET
MASK
91 AGC SLOW
92 SYNC DET
93 ACK
45 HD INS
46 V MUTE
49 UN JOG DOP
TO VA-62BOARD(1/3) (VIDEO BLOCK)
(See page 159, 16
CN650 4P
4 FPDER CONT
2 CAM GND
3 CAM C
1 CAM Y
TO VC-67PBOARD CN307
(See page 120.)

VA-62 (Y/CHROMA SIGNAL PROCESS, AUDIO SIGNAL PROCESS) PRINTED WIRING BOARD
—Ref. No. VA-62 BOARD : 1000 series—

VA-62 BOARD (COMPONENT SIDE)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D670
S VIDEO
SW650
J650
D672
Q447
D680
D683
D676
D675
D679
D682
D681
D674
J651(1/4) AUDIO R
J651(1/4) AUDIO L
J651(1/4) RFU DC
J651(1/4) VIDEO
D690
D671
Q741
Q740
Q770
Q772
D669
Q643
W650
IC661
IC416
RV666
L689
Q715
Q774
Q432
Q431
FL653
L690
L670
Q645
RV661
Q775
Q736
Q423
RV686
Q686
FL652
FP260
CF605
L443
FL660
Q712
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Q429
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Q707
Q781
Q723
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IC553
Q430
Q607
Q690
CN552
Q556
Q773
Q703
C752
IC554
D554
Q694
L668
Q702
Q555
IC555
Q606
Q658
IC653
RV662
CN650
D651
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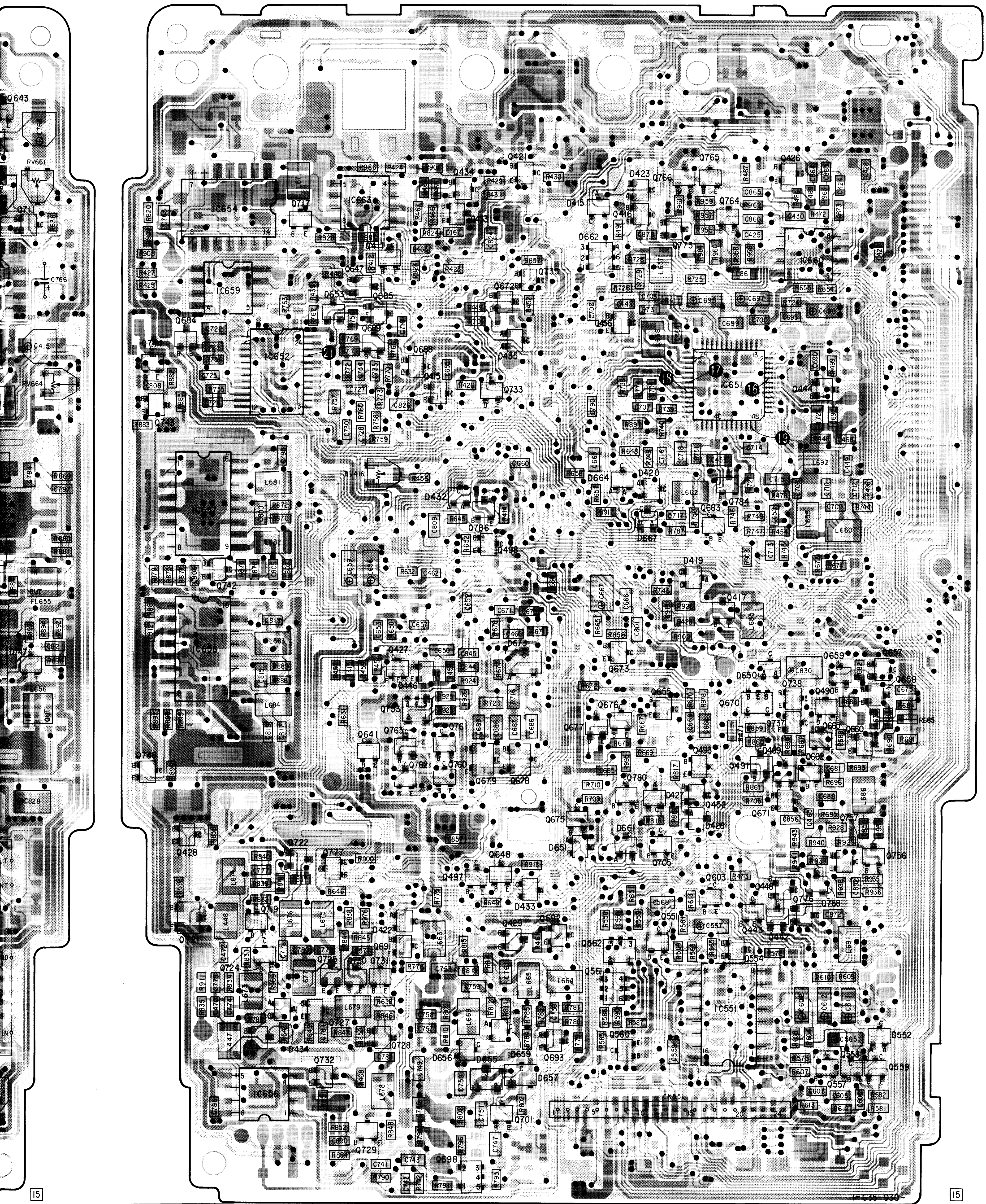
D608
D654
Q700
L667
RV663
D553
1-635-930-
15

VA-62 BOARD (CONDUCTOR SIDE)


IC654
IC653
IC659
IC652
IC651
IC650
IC657
IC658
IC655
IC656
IC551
CN551
RV661
RV664
RV416
FL655
FL656
L660
L662
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L683
L684
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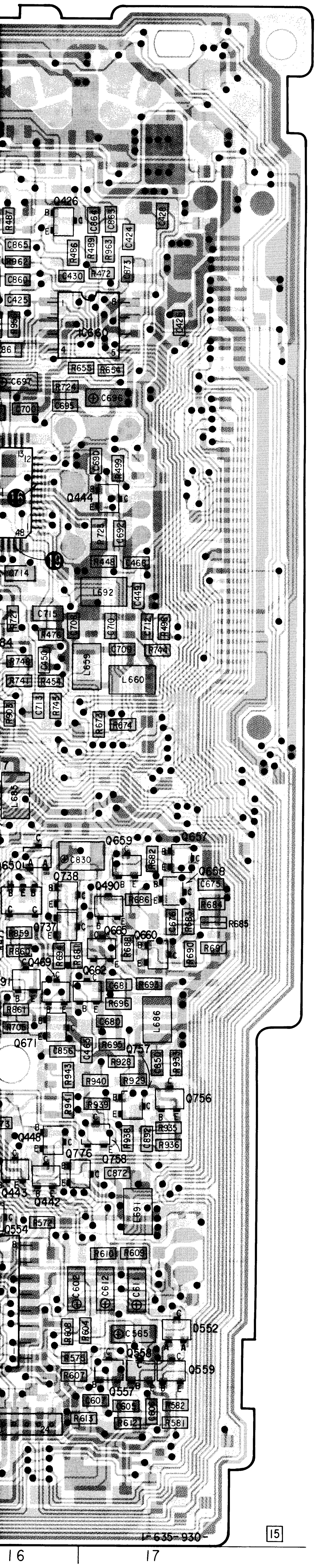

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D417	8-719-941-86	DAN202U
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D420	8-719-941-86	DAN202U
D422	8-719-941-86	DAN202U
D423	8-719-941-86	DAN202U
D427	8-719-941-86	DAN202U
D428	8-719-941-86	DAN202U
D432	8-719-941-86	DAN202U
D433	8-719-941-09	DAP202U
D434	8-719-941-09	DAP202U
D435	8-719-941-86	DAN202U
D436	8-719-941-86	DAN202U
D437	8-719-941-86	DAN202U
D551	8-719-404-46	MA110
D552	8-719-941-86	DAN202U
D553	8-719-941-86	DAN202U
D554	8-719-404-46	MA110
D650	8-719-941-86	DAN202U
D651	8-719-941-86	DAN202U
D652	8-719-941-86	DAN202U
D653	8-719-941-86	DAN202U
D654	8-719-941-86	DAN202U
D655	8-719-800-76	1SS226
D656	8-719-941-86	DAN202U
D657	8-719-800-76	1SS226
D658	8-719-941-86	DAN202U
D659	8-719-941-86	DAN202U
D661	8-719-941-86	DAN202U
D662	8-719-951-22	IMN10
D663	8-719-941-86	DAN202U
D664	8-719-941-86	DAN202U
D667	8-719-941-86	DAN202U
D669	8-719-977-22	DTZ9. 1
D670	8-719-977-22	DTZ9. 1
D671	8-719-977-22	DTZ9. 1
D672	8-719-977-22	DTZ9. 1
D673	8-719-800-76	1SS226
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D675	8-719-977-22	DTZ9. 1
D676	8-719-977-22	DTZ9. 1
D679	8-719-977-22	DTZ9. 1
D680	8-719-977-22	DTZ9. 1
D681	8-719-977-22	DTZ9. 1
D682	8-719-977-22	DTZ9. 1
D683	8-719-977-22	DTZ9. 1
D690	8-719-941-86	DAN202U

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IC416	8-759-710-09	NJM2233AM
IC551	8-759-300-71	MC14053BF
IC553	8-759-998-98	LM358D
IC554	8-759-008-67	MC14066BF
IC555	8-759-701-02	NJM2073M
IC650	8-752-036-19	CXA1207R
IC651	8-752-036-20	CXA1208R
IC652	8-759-605-61	CXA1203N
IC653	8-759-925-60	BA401
IC654	8-752-009-51	CX20095A
IC656	8-759-320-76	HA118070FP
IC657	8-752-333-24	CXL1506M
IC658	8-752-333-24	CXL1506M
IC659	8-759-710-29	NJM2235M
IC660	8-759-710-07	NJM2234M
IC661	8-759-710-07	NJM2234M
IC662	8-759-009-22	MC14094BF
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Q411	8-729-905-23	2SA1576-R
Q415	8-729-905-23	2SA1576-R
Q416	8-729-905-35	2SC4081-R
Q417	8-729-905-12	DTA144EU
Q418	8-729-905-35	2SC4081-R
Q421	8-729-905-23	2SA1576-R
Q422	8-729-905-18	DTC144EU
Q423	8-729-905-35	2SC4081-R
Q426	8-729-905-35	2SC4081-R
Q427	8-729-905-35	2SC4081-R
Q428	8-729-905-XX	DTC114TU
Q429	8-729-905-35	2SC4081-R
Q430	8-729-905-18	DTC144EU
Q431	8-729-905-23	2SA1576-R
Q432	8-729-905-23	2SA1576-R
Q433	8-729-905-35	2SC4081-R
Q434	8-729-905-23	2SA1576-R
Q439	8-729-905-12	DTA144EU
Q440	8-729-905-35	2SC4081-R
Q442	8-729-905-18	DTC144EU
Q443	8-729-905-18	DTC144EU
Q444	8-729-905-35	2SC4081-R
Q446	8-729-905-35	2SC4081-R
Q447	8-729-905-12	DTA144EU
Q448	8-729-905-18	DTC144EU
Q452	8-729-905-18	DTC144EU
Q456	8-729-905-18	DTC144EU
Q469	8-729-905-18	DTC144EU
Q490	8-729-905-35	2SC4081-R
Q491	8-729-905-12	DTA144EU
Q493	8-729-905-12	DTA144EU
Q494	8-729-905-35	2SC4081-R
Q496	8-729-905-35	2SC4081-R
Q497	8-729-905-18	DTC144EU
Q498	8-729-905-18	DTC144EU
Q551	8-729-905-23	2SA1576-R
Q552	8-729-905-23	2SA1576-R
Q553	8-729-905-35	2SC4081-R
Q554	8-729-905-35	2SC4081-R
Q555	8-729-905-35	2SC4081-R
Q556	8-729-905-35	2SC4081-R
Q557	8-729-905-18	DTC144EU
Q558	8-729-905-12	DTA144EU
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Q561	8-729-907-26	IMX1
Q562	8-729-904-07	FMG2
Q603	8-729-905-35	2SC4081-R
Q606	8-729-902-93	FMG4
Q607	8-729-922-94	DTC143TU
Q608	8-729-905-23	2SA1576-R
Q643	8-729-905-23	2SA1576-R
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D422	8-719-941-86	DAN202U
D423	8-719-941-86	DAN202U
D427	8-719-941-86	DAN202U
D428	8-719-941-86	DAN202U
D432	8-719-941-86	DAN202U
D433	8-719-941-09	DAP202U
D434	8-719-941-09	DAP202U
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D674	8-719-977-22	DTZ9.1
D675	8-719-977-22	DTZ9.1
D676	8-719-977-22	DTZ9.1
D679	8-719-977-22	DTZ9.1
D680	8-719-977-22	DTZ9.1
D681	8-719-977-22	DTZ9.1
D682	8-719-977-22	DTZ9.1
D683	8-719-977-22	DTZ9.1
D690	8-719-941-86	DAN202U

< IC >

IC416	8-759-710-09	NJM2233AM
IC551	8-759-300-71	MC14053BF
IC553	8-759-998-98	LM358D
IC554	8-759-008-67	MC14066BF
IC555	8-759-701-02	NJM2073M
IC650	8-752-036-19	CXA1207R
IC651	8-752-036-20	CXA1208R
IC652	8-759-605-61	CXA1203N
IC653	8-759-925-60	BA401
IC654	8-752-009-51	CX20095A
IC656	8-759-320-76	HA118070FP
IC657	8-752-333-24	CXL1506M
IC658	8-752-333-24	CXL1506M
IC659	8-759-710-29	NJM2235M
IC660	8-759-710-07	NJM2234M
IC661	8-759-710-07	NJM2234M
IC662	8-759-009-22	MC14094BF
IC663	8-759-710-29	NJM2235M

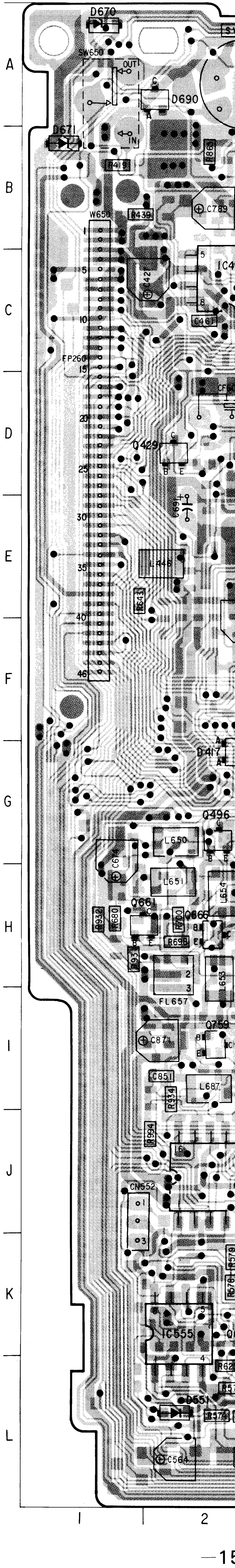
< TRANSISTOR >

Q411	8-729-905-23	2SA1576-R
Q415	8-729-905-23	2SA1576-R
Q416	8-729-905-35	2SC4081-R
Q417	8-729-905-12	DTA144EU
Q418	8-729-905-35	2SC4081-R
Q421	8-729-905-23	2SA1576-R
Q422	8-729-905-18	DTC144EU
Q423	8-729-905-35	2SC4081-R
Q426	8-729-905-35	2SC4081-R
Q427	8-729-905-35	2SC4081-R
Q428	8-729-905-XX	DTC114TU
Q429	8-729-905-35	2SC4081-R
Q430	8-729-905-18	DTC144EU
Q431	8-729-905-23	2SA1576-R
Q432	8-729-905-23	2SA1576-R
Q433	8-729-905-35	2SC4081-R
Q434	8-729-905-23	2SA1576-R
Q439	8-729-905-12	DTA144EU
Q440	8-729-905-35	2SC4081-R
Q442	8-729-905-18	DTC144EU
Q443	8-729-905-18	DTC144EU
Q444	8-729-905-35	2SC4081-R
Q446	8-729-905-35	2SC4081-R
Q447	8-729-905-12	DTA144EU
Q448	8-729-905-18	DTC144EU
Q452	8-729-905-18	DTC144EU
Q456	8-729-905-18	DTC144EU
Q469	8-729-905-18	DTC144EU
Q490	8-729-905-35	2SC4081-R
Q491	8-729-905-12	DTA144EU
Q493	8-729-905-12	DTA144EU
Q494	8-729-905-35	2SC4081-R
Q496	8-729-905-35	2SC4081-R
Q497	8-729-905-18	DTC144EU
Q498	8-729-905-18	DTC144EU
Q551	8-729-905-23	2SA1576-R
Q552	8-729-905-23	2SA1576-R
Q553	8-729-905-35	2SC4081-R
Q554	8-729-905-35	2SC4081-R
Q555	8-729-905-35	2SC4081-R
Q556	8-729-905-35	2SC4081-R
Q557	8-729-905-18	DTC144EU
Q558	8-729-905-12	DTA144EU
Q559	8-729-905-23	2SA1576-R
Q560	8-729-905-18	DTC144EU
Q561	8-729-907-26	IMX1
Q562	8-729-904-07	FMG2
Q603	8-729-905-35	2SC4081-R
Q606	8-729-902-93	FMG4
Q607	8-729-922-94	DTC143TU
Q608	8-729-905-23	2SA1576-R
Q643	8-729-905-23	2SA1576-R
Q645	8-729-905-18	DTC144EU
Q647	8-729-905-18	DTC144EU
Q648	8-729-905-12	DTA144EU
Q649	8-729-905-18	DTC144EU
Q653	8-729-905-18	DTC144EU
Q655	8-729-905-12	DTA144EU
Q657	8-729-905-35	2SC4081-R
Q658	8-729-905-35	2SC4081-R
Q659	8-729-905-35	2SC4081-R
Q660	8-729-905-35	2SC4081-R
Q661	8-729-905-12	DTA144EU
Q662	8-729-905-96	DTA114TU
Q665	8-729-905-45	DTA143EU
Q666	8-729-905-23	2SA1576-R
Q667	8-729-905-18	DTC144EU
Q668	8-729-905-35	2SC4081-R
Q669	8-729-905-12	DTA144EU
Q670	8-729-903-10	FMW1
Q671	8-729-905-23	2SA1576-R
Q672	8-729-905-18	DTC144EU
Q673	8-729-905-12	DTA144EU
Q674	8-729-141-48	2SB624-BV345
Q675	8-729-905-18	DTC144EU
Q676	8-729-905-12	DTA144EU
Q677	8-729-905-12	DTA144EU
Q678	8-729-202-38	2SC3326N
Q679	8-729-202-38	2SC3326N
Q680	8-729-905-35	2SC4081-R
Q681	8-729-905-35	2SC4081-R
Q683	8-729-905-23	2SA1576-R
Q684	8-729-905-18	DTC144EU
Q685	8-729-905-12	DTA144EU
Q686	8-729-905-35	2SC4081-R
Q687	8-729-905-35	2SC4081-R
Q688	8-729-905-35	2SC4081-R
Q689	8-729-905-35	2SC4081-R
Q690	8-729-141-48	2SB624-BV345
Q691	8-729-905-18	DTC144EU
Q692	8-729-905-18	DTC144EU
Q693	8-729-905-35	2SC4081-R
Q694	8-729-905-35	2SC4081-R
Q696	8-729-905-18	DTC144EU
Q698	8-729-903-10	FMW1
Q700	8-729-202-38	2SC3326N
Q701	8-729-905-35	2SC4081-R
Q702	8-729-905-35	2SC4081-R
Q703	8-729-903-10	FMW1
Q705	8-729-905-12	DTA144EU
Q707	8-729-904-20	FMA2
Q708	8-729-904-07	FMG2
Q711	8-729-905-12	DTA144EU
Q712	8-729-905-12	DTA144EU
Q717	8-729-905-23	2SA1576-R
Q719	8-729-905-18	DTC144EU
Q721	8-729-202-38	2SC3326N
Q722	8-729-905-35	2SC4081-R
Q723	8-729-904-07	FMG2
Q724	8-729-905-23	2SA1576-R
Q725	8-729-905-23	2SA1576-R
Q727	8-729-905-45	DTA143EU
Q728	8-729-905-23	2SA1576-R
Q729	8-729-905-35	2SC4081-R
Q730	8-729-905-23	2SA1576-R
Q731	8-729-905-12	DTA144EU
Q732	8-729-905-35	2SC4081-R
Q733	8-729-905-18	DTC144EU
Q734	8-729-905-18	DTC144EU
Q735	8-729-905-35	2SC4081-R
Q736	8-729-905-45	DTA143EU
Q737	8-729-905-35	2SC4081-R
Q738	8-729-905-35	2SC4081-R
Q742	8-729-905-23	2SA1576-R
Q743	8-729-905-35	2SC4081-R
Q744	8-729-905-35	2SC4081-R
Q745	8-729-905-18	DTC144EU
Q746	8-729-141-48	2SB624-BV345
Q747	8-729-905-23	2SA1576-R
Q748	8-729-905-35	2SC4081-R
Q751	8-729-905-35	2SC4081-R
Q752	8-729-905-23	2SA1576-R
Q753	8-729-904-20	FMA2
Q756	8-729-905-18	DTC144EU
Q757	8-729-905-35	2SC4081-R
Q758	8-729-905-23	2SA1576-R
Q759	8-729-905-35	2SC4081-R
Q760	8-729-905-12	DTA144EU
Q761	8-729-905-18	DTC144EU
Q762	8-729-905-18	DTC144EU
Q763	8-729-905-18	DTC144EU
Q764	8-729-905-35	2SC4081-R
Q765	8-729-905-35	2SC4081-R
Q766	8-729-905-23	2SA1576-R
Q770	8-729-101-07	2SB798-L
Q772	8-729-905-12	DTA144EU
Q773	8-729-905-12	DTA144EU
Q774	8-729-905-35	2SC4081-R
Q775	8-729-905-18	DTC144EU
Q776	8-729-905-12	DTA144EU
Q777	8-729-905-23	2SA1576-R
Q778	8-729-905-57	DTA124EU
Q779	8-729-905-18	DTC144EU
Q780	8-729-905-18	DTC144EU
Q781	8-729-905-18	DTC144EU
Q784	8-729-905-35	2SC4081-R
Q786	8-729-905-18	DTC144EU

VA-62 (Y/CHROMA SIGNAL P

—Ref. No. VA-62 BOARD: 1000

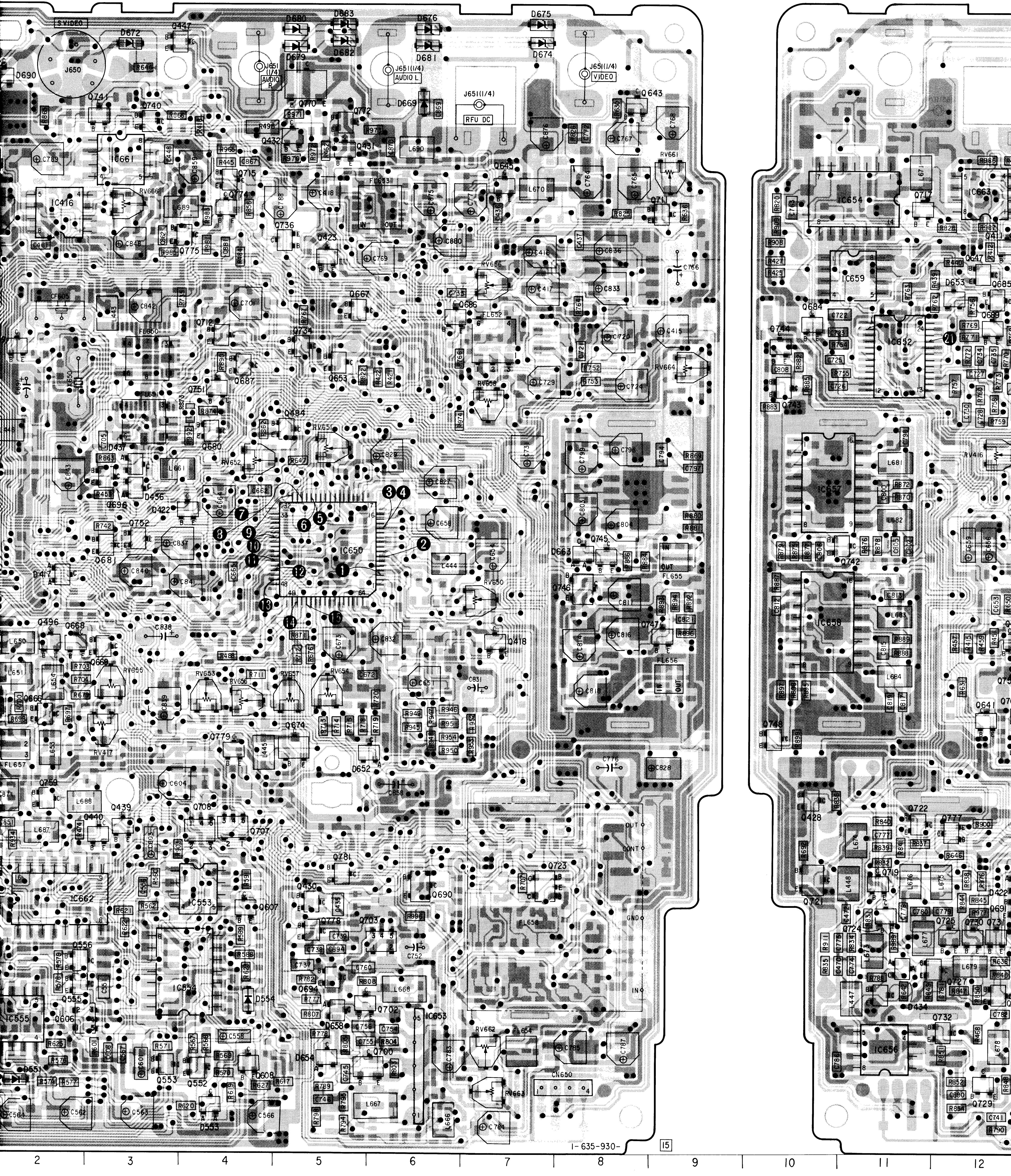
VA-62 BOARD (COMPONE



A SIGNAL PROCESS, AUDIO SIGNAL PROCESS) PRINTED WIRING BOARD
OARD : 1000 series—

(COMPONENT SIDE)

VA-62 BOARD (CONDUCTOR SIDE)



S VIDEO
J650
J651(1/4) AUDIO R
J651(1/4) AUDIO L
J651(1/4) VIDEO
J651(1/4) RFU DC
IC650
IC661
IC416
IC662
IC553
IC554
IC555
IC653
IC654
IC659
IC652
IC657
IC658
IC656
FL655
FL656
FL658
CN650
IN
OUT
CONT
GND
1-635-930-
15
2
3
4
5
6
7
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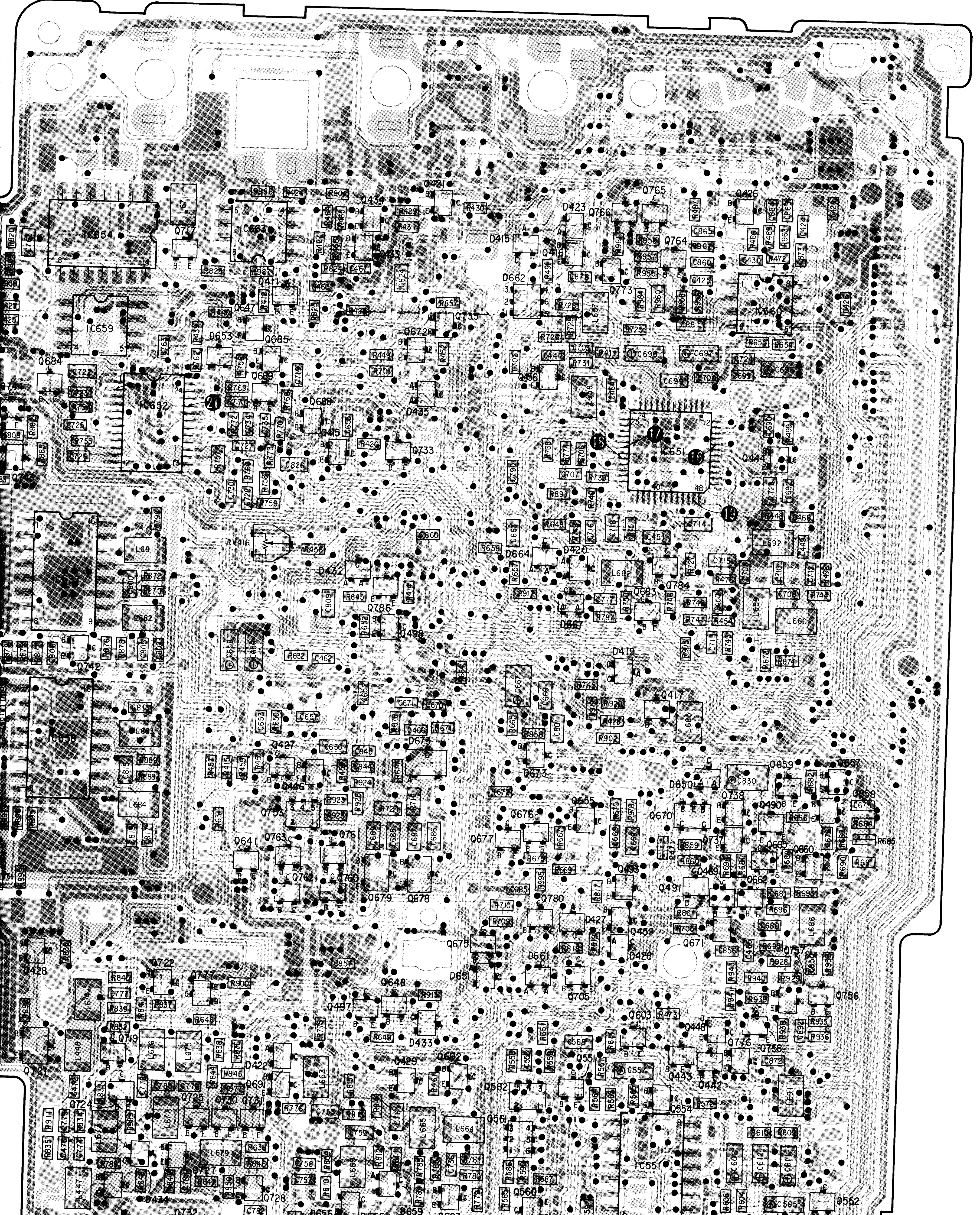
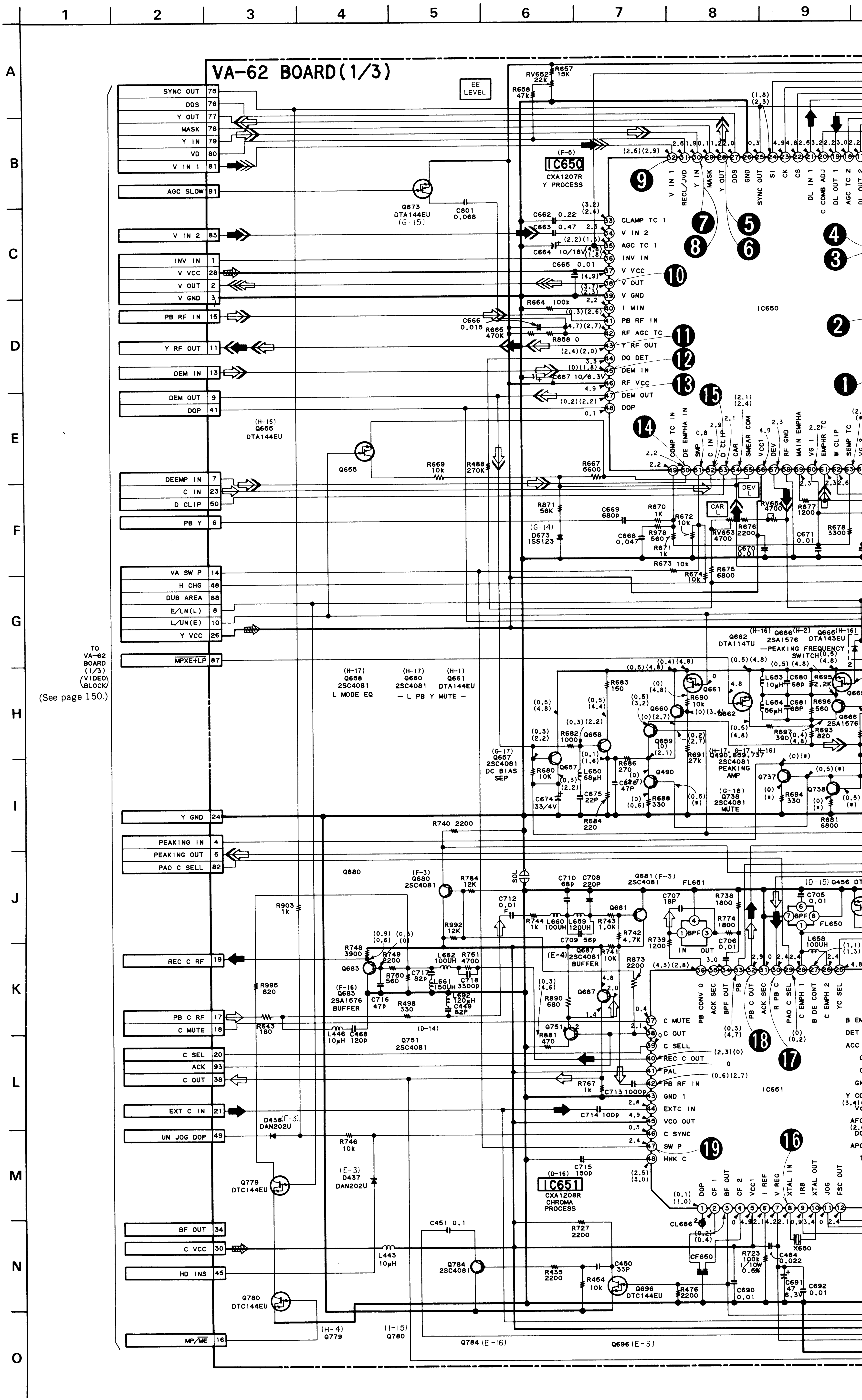
11
12

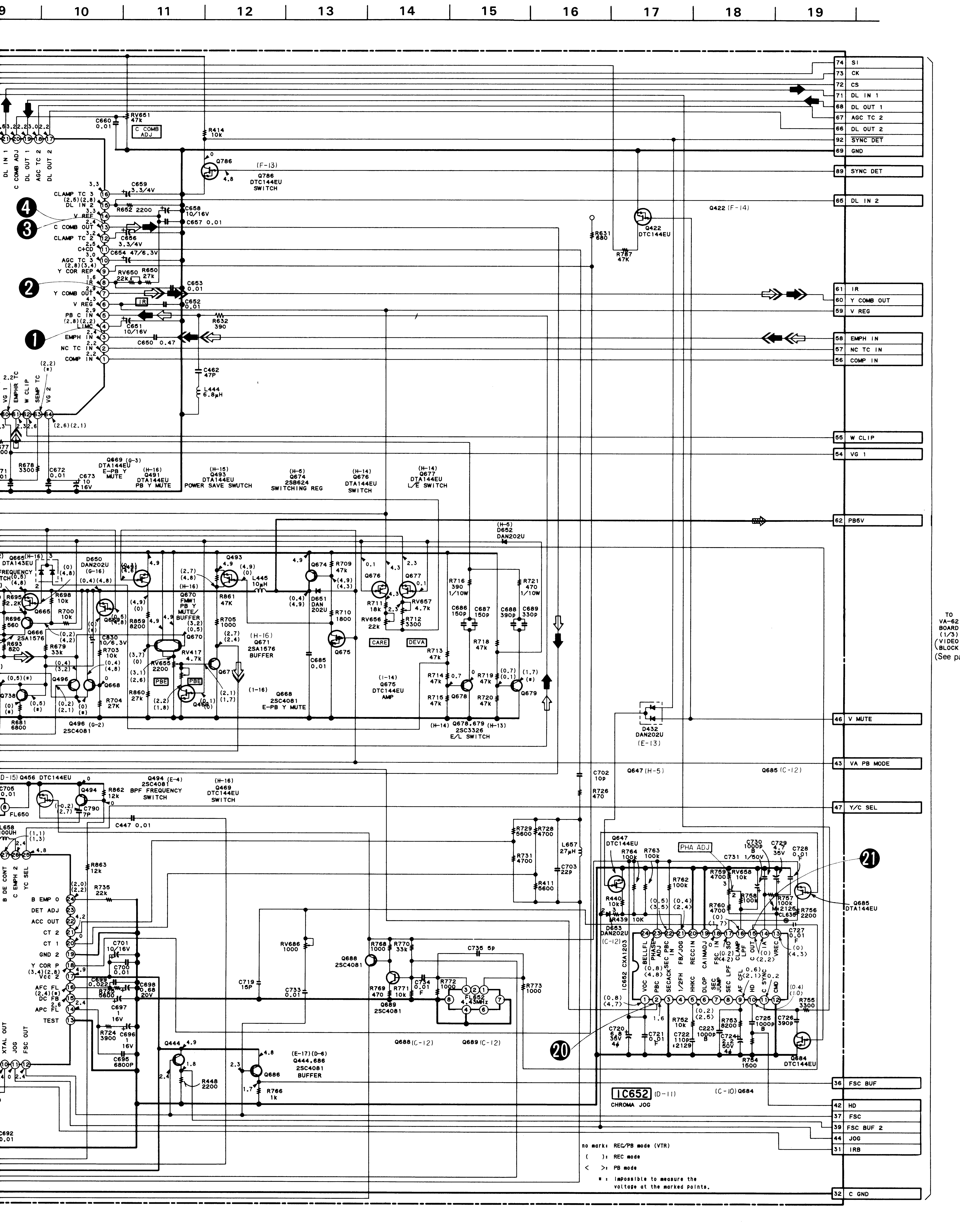
VA-62 BOARD (CONDUCTOR SIDE)

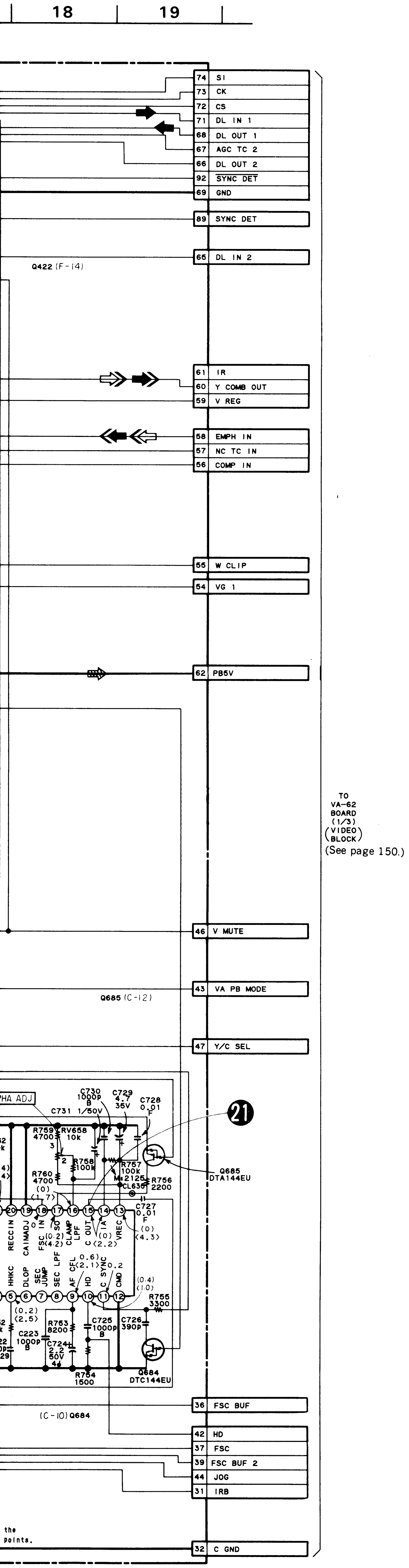

IC654
IC663
IC659
IC852
IC657
IC658
IC651
IC660
IC656
IC551
CN551
RV416
10
11
12
13
14
15
16
17
1-635-930-
15

VA-62 (Y/CHROMA SIGNAL PROCESS, AUDIO SIGNAL PROCESS) SCHEMATIC DIAGRAM

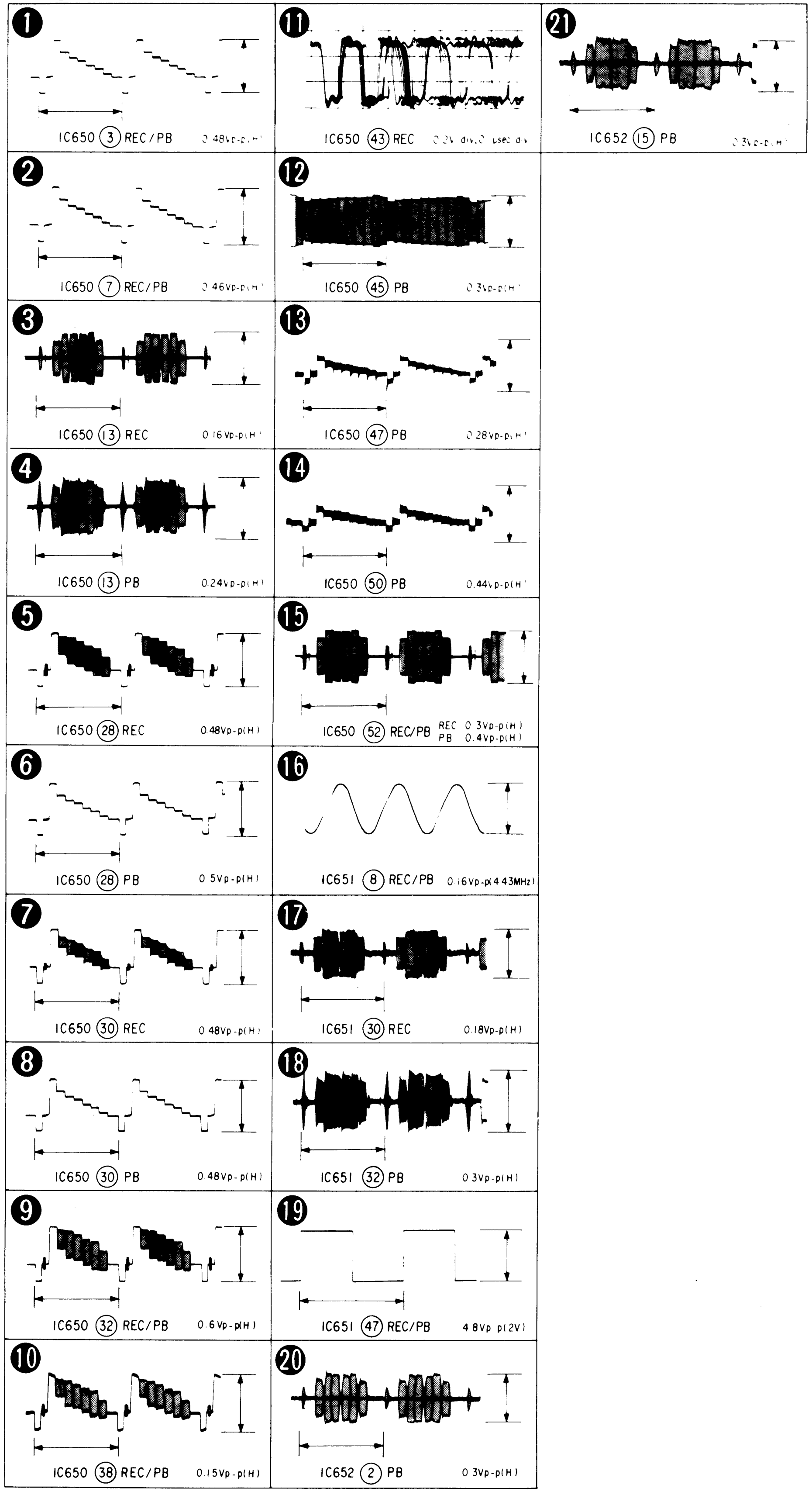
—Ref. No. VA-62 BOARD : 1000 series—


VA-62 BOARD(1/3)
EE LEVEL
IC650
CXA1207R
Y PROCESS
IC651
CXA1208R
CHROMA PROCESS
SYNC OUT 75
DDS 76
Y OUT 77
MASK 78
Y IN 79
VD 80
V IN 1 81
AGC SLOW 91
V IN 2 83
INV IN 1
V VCC 28
V OUT 2
V GND 3
PB RF IN 15
Y RF OUT 11
DEM IN 13
DEM OUT 9
DOP 41
DEEMP IN 7
C IN 23
D CLIP 50
PB Y 6
VA SW P 14
H CHG 48
DUB AREA 88
E/LN(L) 8
L/UN(E) 10
Y VCC 26
MPXE+LP 87
Y GND 24
PEAKING IN 4
PEAKING OUT 5
PAO C SELL 82
REC C RF 19
PB C RF 17
C MUTE 18
C SEL 20
ACK 93
C OUT 38
EXT C IN 21
UN JOG DOP 49
BF OUT 34
C VCC 30
HD INS 45
MP/ME 16
TO VA-62 BOARD (1/3) (VIDEO BLOCK)
(See page 150.)
CLAMP TC 1
V IN 2
AGC TC 1
INV IN
V VCC
V OUT
V GND
I MIN
PB RF IN
RF AGC TC
Y RF OUT
DO DET
DEM IN
RF VCC
DEM OUT
DOP
C MUTE
C OUT
C SELL
REC C OUT
PAL
PB RF IN
GND 1
EXTC IN
VCO OUT
C SYNC
SW P
HHK C
PEAKING FREQUENCY SWITCH
Q673 DTA144EU
Q655 DTA144EU
Q658 2SC4081 L MODE EQ
Q660 2SC4081
Q661 DTA144EU
— L PB Y MUTE —
Q657 2SC4081 DC BIAS SEP
Q490, 659, 737 2SC4081 PEAKING AMP
Q738 2SC4081 MUTE
Q662 DTA114TU
Q666 2SA1576
Q665 DTA143EU
Q680 2SC4081
Q681 2SC4081
Q687 2SC4081 BUFFER
Q683 2SA1576 BUFFER
Q751 2SC4081
Q779 DTC144EU
Q780 DTC144EU
Q784 2SC4081
Q696 DTC144EU
D436 DAN202U
D437 DAN202U
D673 1SS123
FL651
FL650
CF650
X650
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O


9
10
11
12
13
14
15
16
17
18
19
74 SI
73 CK
72 CS
71 DL IN 1
68 DL OUT 1
67 AGC TC 2
66 DL OUT 2
92 SYNC DET
69 GND
89 SYNC DET
65 DL IN 2
61 IR
60 Y COMB OUT
59 V REG
58 EMPH IN
57 NC TC IN
56 COMP IN
55 W CLIP
54 VG 1
62 PB5V
46 V MUTE
43 VA PB MODE
47 Y/C SEL
36 FSC BUF
42 HD
37 FSC
39 FSC BUF 2
44 JOG
31 IRB
32 C GND
TO VA-62 BOARD (1/3) (VIDEO BLOCK (See p
RV651 47k
C COMB ADJ
C660 0.01
R414 10k
Q786 DTC144EU SWITCH
(F-13)
CLAMP TC 3
DL IN 2
V REF
C COMB OUT
CLAMP TC 2
C+CD
AGC TC 3
Y COR REP
IR
Y COMB OUT
V REG
PB C IN
LIMC
EMPH IN
NC TC IN
COMP IN
C659 3.3/4V
R652 2200
C658 10/16V
C657 0.01
C656 3.3/4V
C654 47/6.3V
RV650 22k
R650 27k
C653 0.01
C652 0.01
R632 390
C651 10/16V
C650 0.47
C462 47P
L444 6.8µH
VG 1
EMPHR TC
W CLIP
SEMP TC
VG 2
Q422 DTC144EU
Q422 (F-14)
R631 680
R787 47K
R678 3300
C672 0.01
C673 10 16V
Q669 (G-3) DTA144EU E-PB Y MUTE
(H-16) Q491 DTA144EU PB Y MUTE
(H-15) Q493 DTA144EU POWER SAVE SWUTCH
(H-5) Q674 2SB624 SWITCHING REG
(H-14) Q676 DTA144EU SWITCH
(H-14) Q677 DTA144EU L/E SWITCH
(H-5) D652 DAN202U
D650 DAN202U (G-16)
Q665 (H-16) DTA143EU
FREQUENCY
Q666 2SA1576
Q670 FMW1 PB Y MUTE/ BUFFER
(H-16) Q671 2SA1576 BUFFER
L445 10µH
D651 DAN 202U
R709 47k
R710 1800
C685 0.01
Q675
R711 18k
RV656 22k
RV657 4.7k
R712 3300
CARE
DEVA
R716 390 1/10W
R721 470 1/10W
C686 150p
C687 150p
C688 390p
C689 330p
R713 47k
R718 47k
R714 47k
R719 47k
R715 47k
R720 47k
Q678
Q679
(I-14) Q675 DTC144EU AMP
(I-16) Q668 2SC4081 E-PB Y MUTE
Q678,679 2SC3326 E/L SWITCH (H-14) (H-13)
D432 DAN202U (E-13)
Q496 (G-2) 2SC4081
R681 6800
R698 10k
R700 10k
R695 2.2K
R696 560
R693 820
R679 33k
C830 10/6.3V
R703 10k
R704 27K
R859 8200
R860 27k
RV655 2200
RV417 4.7k
PBE
R861 47K
R705 1000
Q456 DTC144EU
Q494 (E-4) 2SC4081 BPF FREQUENCY SWITCH
(H-16) Q469 DTC144EU SWITCH
R862 12k
C790 7P
C447 0.01
FL650
R863 12k
R735 22k
B EMP O
DET ADJ
ACC OUT
CT 2
CT 1
GND 2
Y COR P
Vcc 2
AFC FL
DC FB
APC FL
TEST
C701 10/16V
C700 0.01
C698 0.68 20V
C699 0.022
R725 5600
C697 1 16V
R724 3900
C696 1 16V
C695 6800P
XTAL OUT
JOG
FSC OUT
B DE CONT
C EMPH 2
YC SEL
C692 0.01
Q444
R448 2200
Q686
R766 1k
(E-17) (D-6) Q444,686 2SC4081 BUFFER
RV686 1000
C719 15P
C733 0.01
Q688 2SC4081
R768 1000
R770 33k
R769 470
R771 10k
Q689 2SC4081
C734 0.01 F
R772 1000
C735 5p
FL652 4.43MHz
R773 1000
Q688 (C-12)
Q689 (C-12)
C702 10p
R726 470
R729 5600
R728 4700
R731 4700
L657 27µH
C703 22p
R411 5600
Q647 (H-5)
Q685 (C-12)
Q647 DTC144EU
R764 100k
R763 100k
PHA ADJ
C731 1/50V
C730 1000p B
C729 4.7 35V
C728 0.01 F
R762 100k
R759 4700
RV658 10k
R758 100k
R757 100k
M2126 CL636
R756 2200
R760 4700
R440 10k
R439 10K
D653 DAN202U (C-12)
Q685 DTA144EU
C727 0.01 F
IC652 CXA1203
BELLFL
PHASE ADJ
SEC PBC IN
FB/JOG
RECC IN
CAIMADJ
FSC IN
CLAMP LPF
C OUT
VTA
VREC
VOC
PBC
SECACK
1/2FH
HHKC
DLOP
SEC JUMP
SEC LPF
AF CFL
HD
C SYNC
CMD
R755 3300
C720 6.8 35V
C721 0.01 F
R752 10k
C722 110p
C223 1000p B
R753 8200
C724 2.2 50V
R754 1500
C725 1000p B
C726 390p
Q684 DTC144EU
IC652 (D-11) CHROMA JOG
(C-10) Q684
no mark: REC/PB mode (VTR)
( ): REC mode
< >: PB mode
*: Impossible to measure the voltage at the marked points.


18
19
74 SI
73 CK
72 CS
71 DL IN 1
68 DL OUT 1
67 AGC TC 2
66 DL OUT 2
92 SYNC DET
69 GND
89 SYNC DET
65 DL IN 2
Q422 (F-14)
61 IR
60 Y COMB OUT
59 V REG
58 EMPH IN
57 NC TC IN
56 COMP IN
55 W CLIP
54 VG 1
62 PB5V
46 V MUTE
43 VA PB MODE
Q685 (C-12)
47 Y/C SEL
36 FSC BUF
(C-10) Q684
42 HD
37 FSC
39 FSC BUF 2
44 JOG
31 IRB
32 C GND
TO VA-62 BOARD (1/3) (VIDEO BLOCK)
(See page 150.)
PHA ADJ
C730 1000p B
C729 4.7 35V
C728 0.01 F
C731 1/50V
R759 4700
RV658 10k
R758 100k
R757 100k
R760 4700
2126 CL636
R756 2200
Q685 DTA144EU
C727 0.01 F
RECC IN
CAIMADJ
FSC IN
SO
CLAMP LPF
C OUT
IA
VREC
HHKC
DLOP
SEC JUMP
SEC LPF
AF CFL
HD
C SYNC
CMD
R755 3300
R753 8200
C223 1000p B
C724 2.2 50V
C725 1000p B
C726 390p
R754 1500
Q684 DTC144EU
the
points.

VA-62 BOARD



- **Signal path**

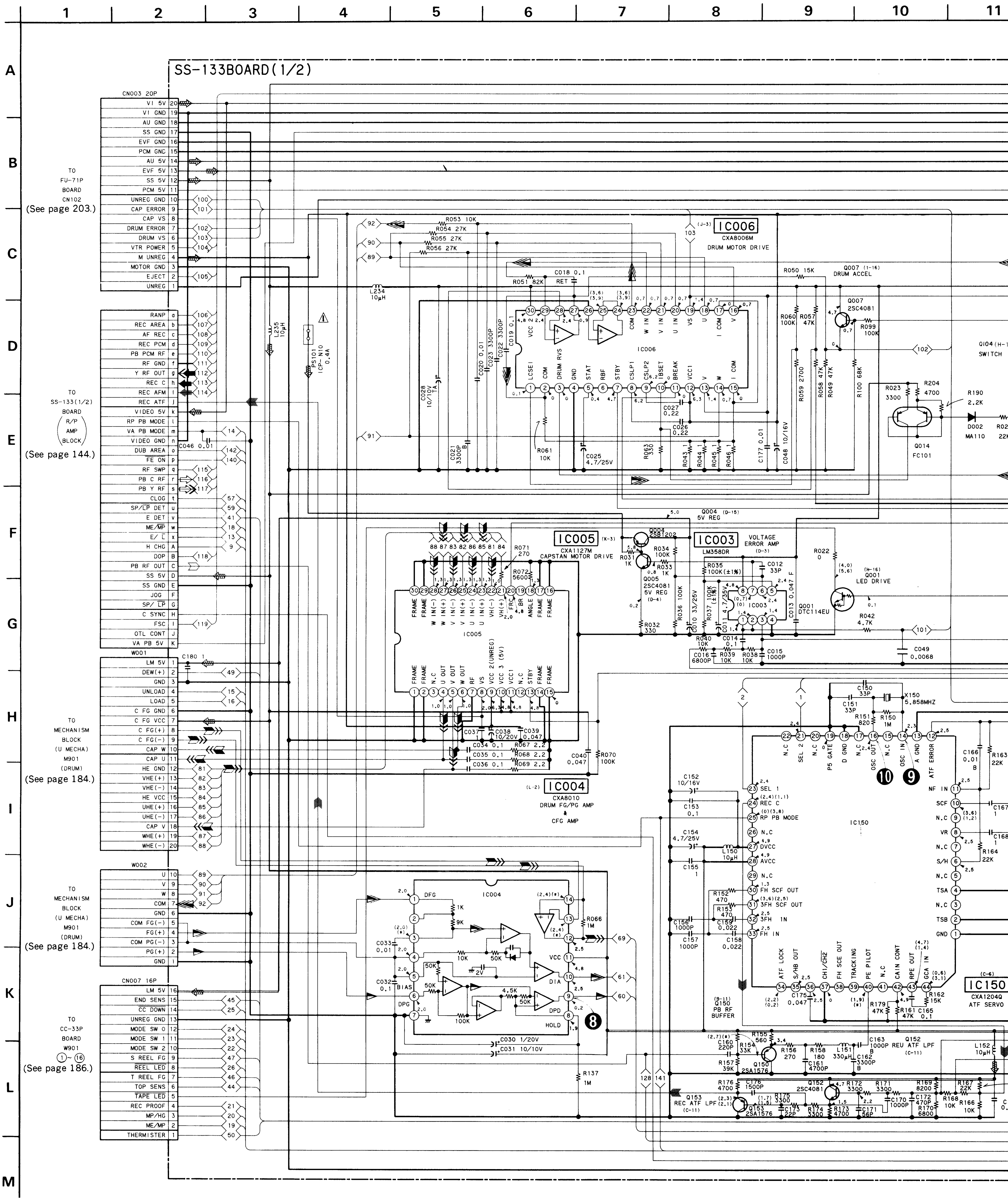
	VIDEO Signal		
	CHROMA	Y	Y/CHROMA
REC	➡	➡》	➡》》
PB	⇨	⇨》	⇨》》

• **Signal path**

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo(speed and phase)		▷▷▷	
Capstan speed servo		⊳	
Capstan phase servo	▶›	⊳›	⊳›
Capstan servo(speed and phase)		⊳››	
Ref.signal	▶	⊳	▷

SS-133 (SERVO, SYSTEM CONTROL, REC/PB AMP) SCHEMATIC DIAGRAM

—Ref. No. SS-133 BOARD : 2000 series—


1
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11
A
B
C
D
E
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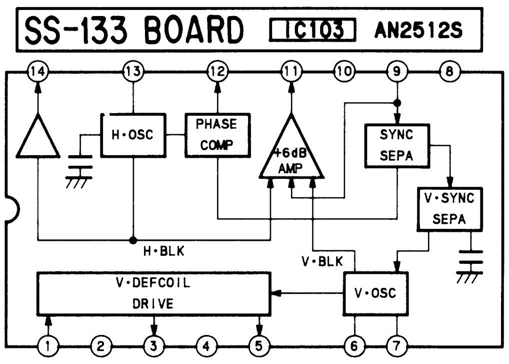
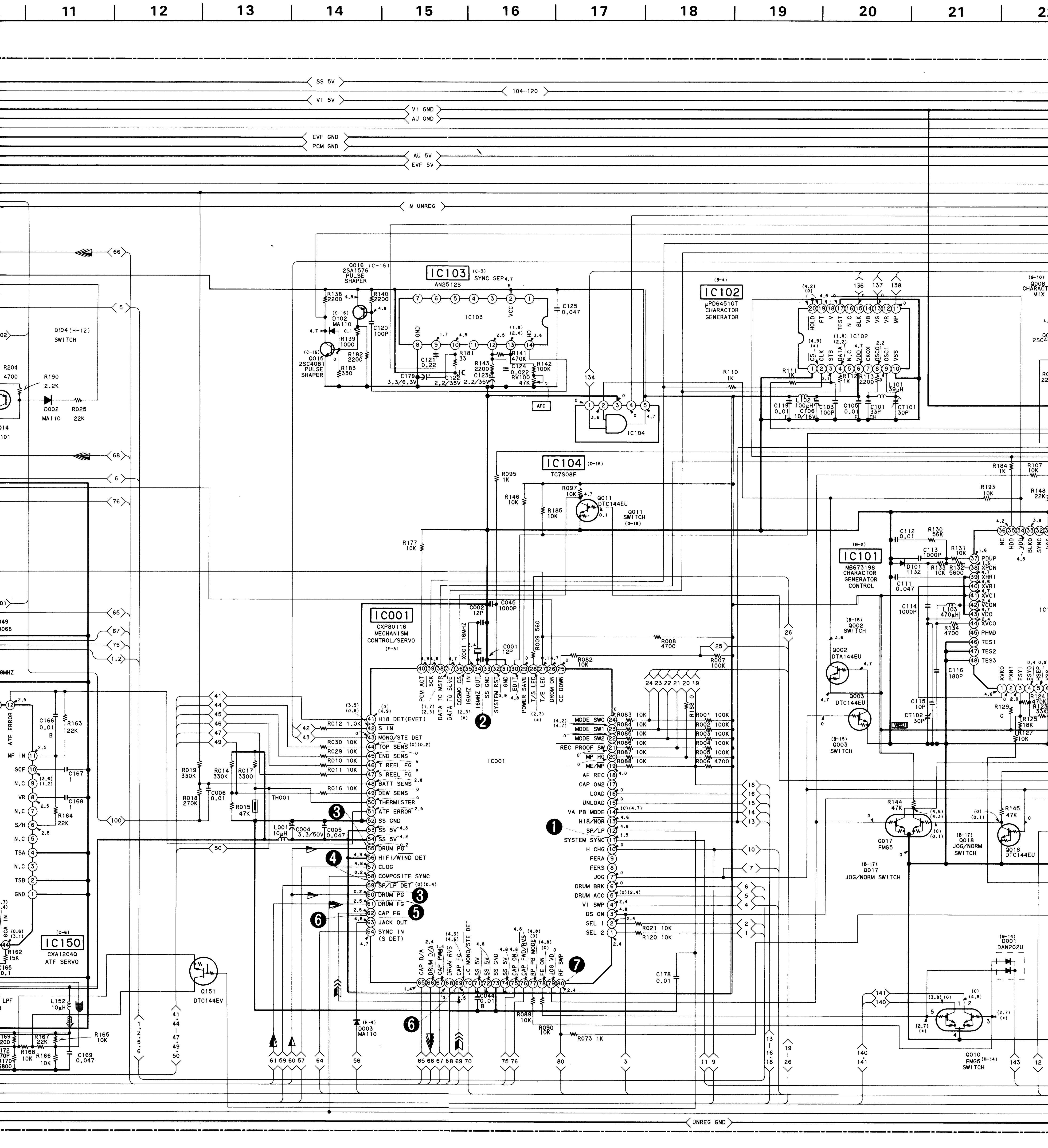
G
H
I
J
K
L
M
SS-133BOARD(1/2)
CN003 20P
VI 5V 20
VI GND 19
AU GND 18
SS GND 17
EVF GND 16
PCM GND 15
AU 5V 14
EVF 5V 13
SS 5V 12
PCM 5V 11
UNREG GND 10
CAP ERROR 9
CAP VS 8
DRUM ERROR 7
DRUM VS 6
VTR POWER 5
M UNREG 4
MOTOR GND 3
EJECT 2
UNREG 1
TO FU-71P BOARD CN102
(See page 203.)
RANP a
REC AREA b
AF REC c
REC PCM d
PB PCM RF e
RF GND f
Y RF OUT g
REC C h
REC AFM i
REC ATF j
VIDEO 5V k
RP PB MODE l
VA PB MODE m
VIDEO GND n
DUB AREA o
FE ON p
RF SWP q
PB C RF r
PB Y RF s
CLOG t
SP/LP DET u
E DET v
ME/MP w
E/L x
H CHG A
DOP B
PB RF OUT C
SS 5V D
SS GND E
JOG F
SP/LP G
C SYNC H
FSC I
OTL CONT J
VA PB 5V K
TO SS-133(1/2) BOARD R/P AMP BLOCK
(See page 144.)
W001
LM 5V 1
DEW(+) 2
GND 3
UNLOAD 4
LOAD 5
C FG GND 6
C FG VCC 7
C FG(+) 8
C FG(-) 9
CAP W 10
CAP U 11
HE GND 12
VHE(+) 13
VHE(-) 14
HE VCC 15
UHE(+) 16
UHE(-) 17
CAP V 18
WHE(+) 19
WHE(-) 20
TO MECHANISM BLOCK (U MECHA) M901 (DRUM)
(See page 184.)
W002
U 10
V 9
W 8
COM 7
GND 6
COM FG(-) 5
FG(+) 4
COM PG(-) 3
PG(+) 2
GND 1
TO MECHANISM BLOCK (U MECHA) M901 (DRUM)
(See page 184.)
CN007 16P
LM 5V 16
END SENS 15
CC DOWN 14
UNREG GND 13
MODE SW 0 12
MODE SW 1 11
MODE SW 2 10
S REEL FG 9
REEL LED 8
T REEL FG 7
TOP SENS 6
TAPE LED 5
REC PROOF 4
MP/HG 3
ME/MP 2
THERMISTER 1
TO CC-33P BOARD W901 ①~⑯
(See page 186.)
IC006 CXA8006M DRUM MOTOR DRIVE
IC005 CXA1127M CAPSTAN MOTOR DRIVE
IC003 LM358DR VOLTAGE ERROR AMP
Q004 2SB1202 5V REG
Q005 2SC4081 5V REG
Q001 DTC114EU LED DRIVE
Q007 2SC4081 DRUM ACCEL
Q104 SWITCH
Q014 FC101
D002 MA110
PS101 ICP-N10 0.4A
IC004 CXA8010 DRUM FG/PG AMP & CFG AMP
IC150 CXA1204Q ATF SERVO
X150 5.858MHZ
Q150 PB RF BUFFER
Q153 REC ATF LPF
Q152 REU ATF LPF
⑧
⑨
⑩

PB	PB
⇨	
⇨	
⇨	
⇨	⇨
⇨	
⇨	⇨

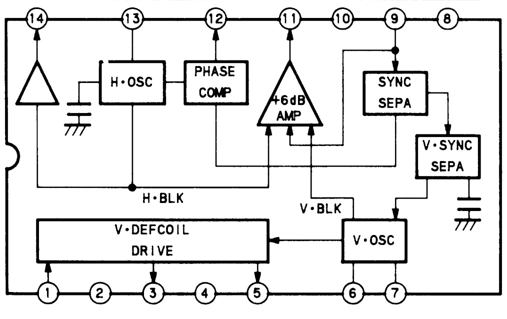
• Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨

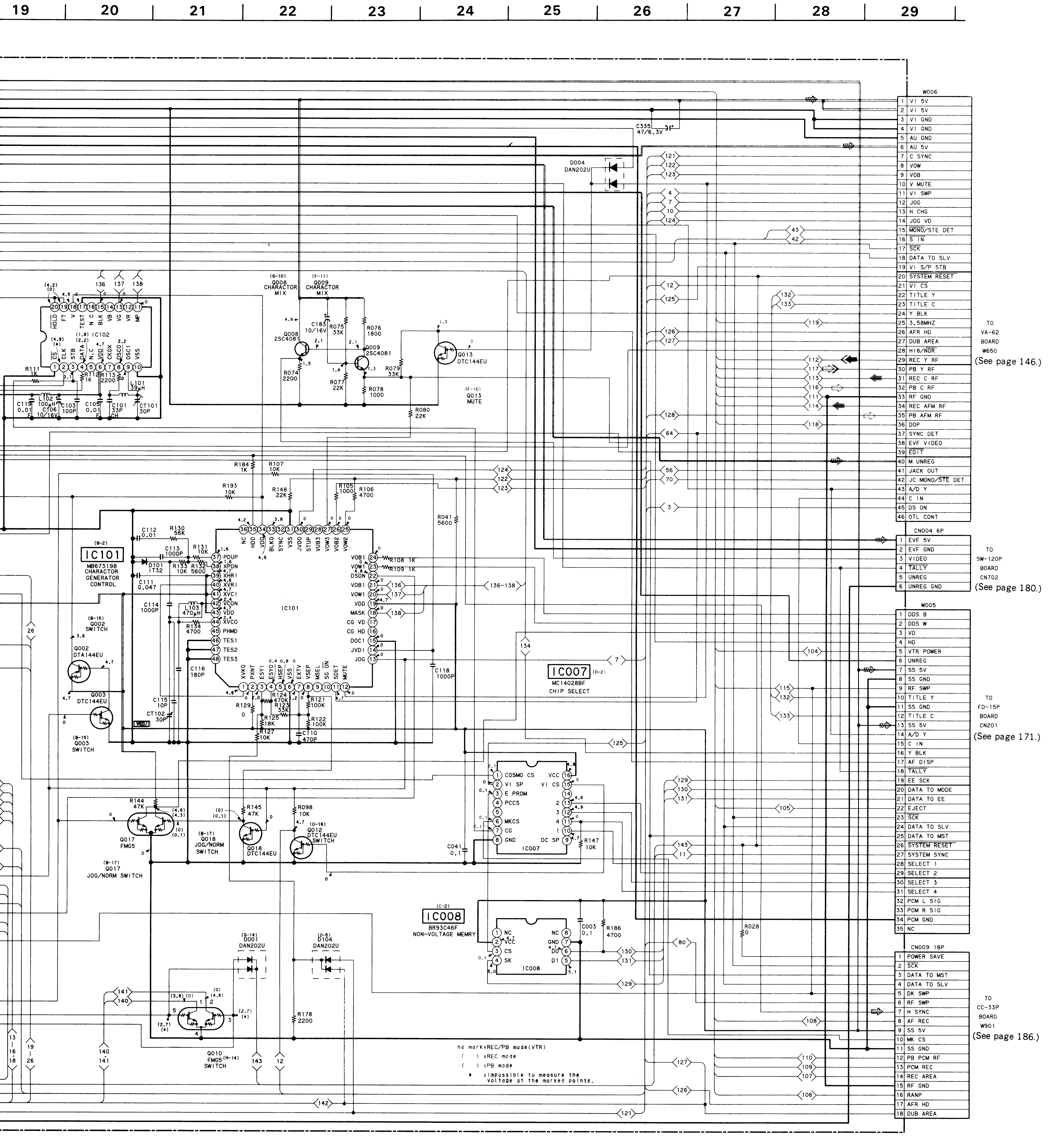

SS-133 BOARD
IC103
AN2512S
H·OSC
PHASE COMP
46dB AMP
SYNC SEPA
V·SYNC SEPA
H·BLK
V·BLK
V·DEFCOIL DRIVE
V·OSC
14
13
12
11
10
9
8
1
2
3
4
5
6
7


11
12
13
14
15
16
17
18
19
20
21
SS 5V
VI 5V
104-120
VI GND
AU GND
EVF GND
PCM GND
AU 5V
EVF 5V
M UNREG
UNREG GND
IC103
SYNC SEP
AN2512S
Q016
2SA1576
PULSE SHAPER
Q015
2SC4081
PULSE SHAPER
D102
MA110
IC102
μPD6451GT
CHARACTOR GENERATOR
IC104
TC7S08F
Q011
DTC144EU
SWITCH
AFC
IC101
MB673198
CHARACTOR GENERATOR CONTROL
Q002
DTA144EU
SWITCH
Q003
DTC144EU
SWITCH
IC001
CXP80116
MECHANISM CONTROL/SERVO
X001 16MHZ
H18 DET(EVET)
S IN
MONO/STE DET
TOP SENS
END SENS
T REEL FG
S REEL FG
BATT SENS
DEW SENS
THERMISTER
ATF ERROR
SS GND
SS 5V
DRUM PG
HIFI/WIND DET
CLOG
COMPOSITE SYNC
SP/LP DET
DRUM PG
DRUM FG
CAP FG
JACK OUT
SYNC IN (S DET)
MODE SW0
MODE SW1
MODE SW2
REC PROOF SW
MP HG
ME/MP
AF REC
CAP ON2
LOAD
UNLOAD
VA PB MODE
H18/NOR
SP/LP
SYSTEM SYNC
H CHG
FERA
FERS
JOG
DRUM BRK
DRUM ACC
VI SWP
DS ON
SEL 1
SEL 2
PCM ACT
SCK
DATA TO MSTR
DATA TO SLVE
COSMO CS
16MHZ IN
16MHZ OUT
SS GND
SYSTEM RST
GND
EDIT
POWER SAVE
T/S LED
T/E LED
DRUM ON
CC DOWN
CAP D/A
DRUM D/A
CAP PWM
DRUM RVS
JC MONO/STE DET
SS 5V
SS 5V
SS GND
CAP ON
CAP FWD/RVS
RP PB MODE
FE ON
JOG VD
RF SWP
TH001
L001 10μH
D003 MA110
IC150
CXA1204Q
ATF SERVO
Q151
DTC144EV
Q104
SWITCH
D002 MA110
Q017
FMG5
JOG/NORM SWITCH
Q018
DTC144EU
JOG/NORM SWITCH
D001
DAN202U
Q010
FMG5
SWITCH
Q008
CHARACT MIX
❶
❷
❸
❹
❺
❻
❼

SS-133 BOARD IC103 AN2512S



H·OSC
PHASE COMP
+6dB AMP
SYNC SEPA
V·SYNC SEPA
H·BLK
V·BLK
V·DEFCOIL DRIVE
V·OSC



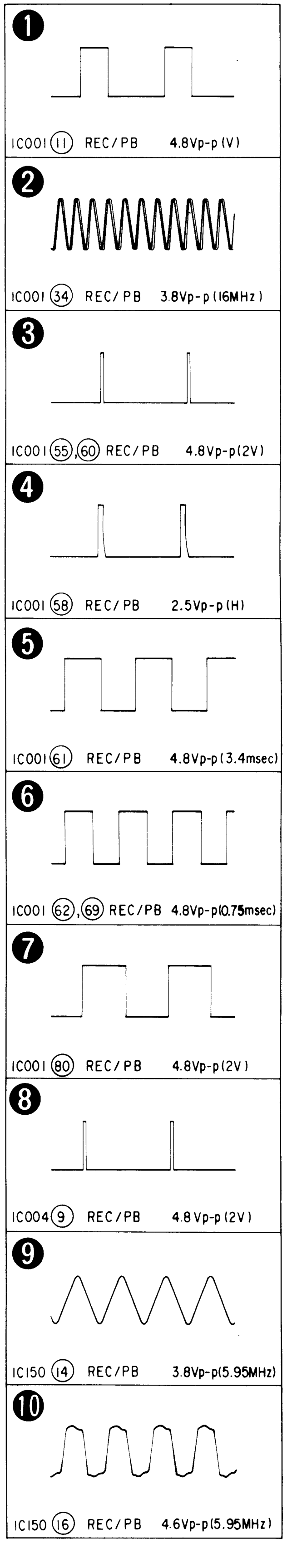
19 20 21 22 23 24 25 26 27 28 29
IC101 MB673198 CHARACTOR GENERATOR CONTROL
IC102
Q008 CHARACTOR MIX 2SC4081
Q009 CHARACTOR MIX 2SC4081
Q013 MUTE DTC144EU
Q002 SWITCH DTA144EU
Q003 SWITCH DTC144EU
Q017 JOG/NORM SWITCH FMG5
Q018 JOG/NORM SWITCH DTC144EU
Q012 SWITCH DTC144EU
Q010 SWITCH FMG5
D001 DAN202U
D104 DAN202U
D004 DAN202U
IC007 MC14028BF CHIP SELECT
IC008 BR93C46F NON-VOLTAGE MEMRY
W006
1 VI 5V
2 VI 5V
3 VI GND
4 VI GND
5 AU GND
6 AU 5V
7 C SYNC
8 VOW
9 VOB
10 V MUTE
11 VI SWP
12 JOG
13 H CHG
14 JOG VD
15 MONO/STE DET
16 S IN
17 SCK
18 DATA TO SLV
19 VI S/P STB
20 SYSTEM RESET
21 VI CS
22 TITLE Y
23 TITLE C
24 Y BLK
25 3.58MHZ
26 AFR HD
27 DUB AREA
28 HI8/NOR
29 REC Y RF
30 PB Y RF
31 REC C RF
32 PB C RF
33 RF GND
34 REC AFM RF
35 PB AFM RF
36 DOP
37 SYNC DET
38 EVF VIDEO
39 EDIT
40 M UNREG
41 JACK OUT
42 JC MONO/STE DET
43 A/D Y
44 C IN
45 DS ON
46 OTL CONT
TO VA-62 BOARD W650 (See page 146.)
CN004 6P
1 EVF 5V
2 EVF GND
3 VIDEO
4 TALLY
5 UNREG
6 UNREG GND
TO SW-120P BOARD CN702 (See page 180.)
W005
1 DDS B
2 DDS W
3 VD
4 HD
5 VTR POWER
6 UNREG
7 SS 5V
8 SS GND
9 RF SWP
10 TITLE Y
11 SS GND
12 TITLE C
13 SS 5V
14 A/D Y
15 C IN
16 Y BLK
17 AF DISP
18 TALLY
19 EE SCK
20 DATA TO MODE
21 DATA TO EE
22 EJECT
23 SCK
24 DATA TO SLV
25 DATA TO MST
26 SYSTEM RESET
27 SYSTEM SYNC
28 SELECT 1
29 SELECT 2
30 SELECT 3
31 SELECT 4
32 PCM L SIG
33 PCM R SIG
34 PCM GND
35 NC
TO FD-15P BOARD CN201 (See page 171.)
CN009 18P
1 POWER SAVE
2 SCK
3 DATA TO MST
4 DATA TO SLV
5 DK SWP
6 RF SWP
7 H SYNC
8 AF REC
9 SS 5V
10 MK CS
11 SS GND
12 PB PCM RF
13 PCM REC
14 REC AREA
15 RF GND
16 RANP
17 AFR HD
18 DUB AREA
TO CC-33P BOARD W901 (See page 186.)
no mark:REC/PB mode(VTR)
( ) :REC mode
〈 〉 :PB mode
* :impossible to measure the voltage at the marked points.

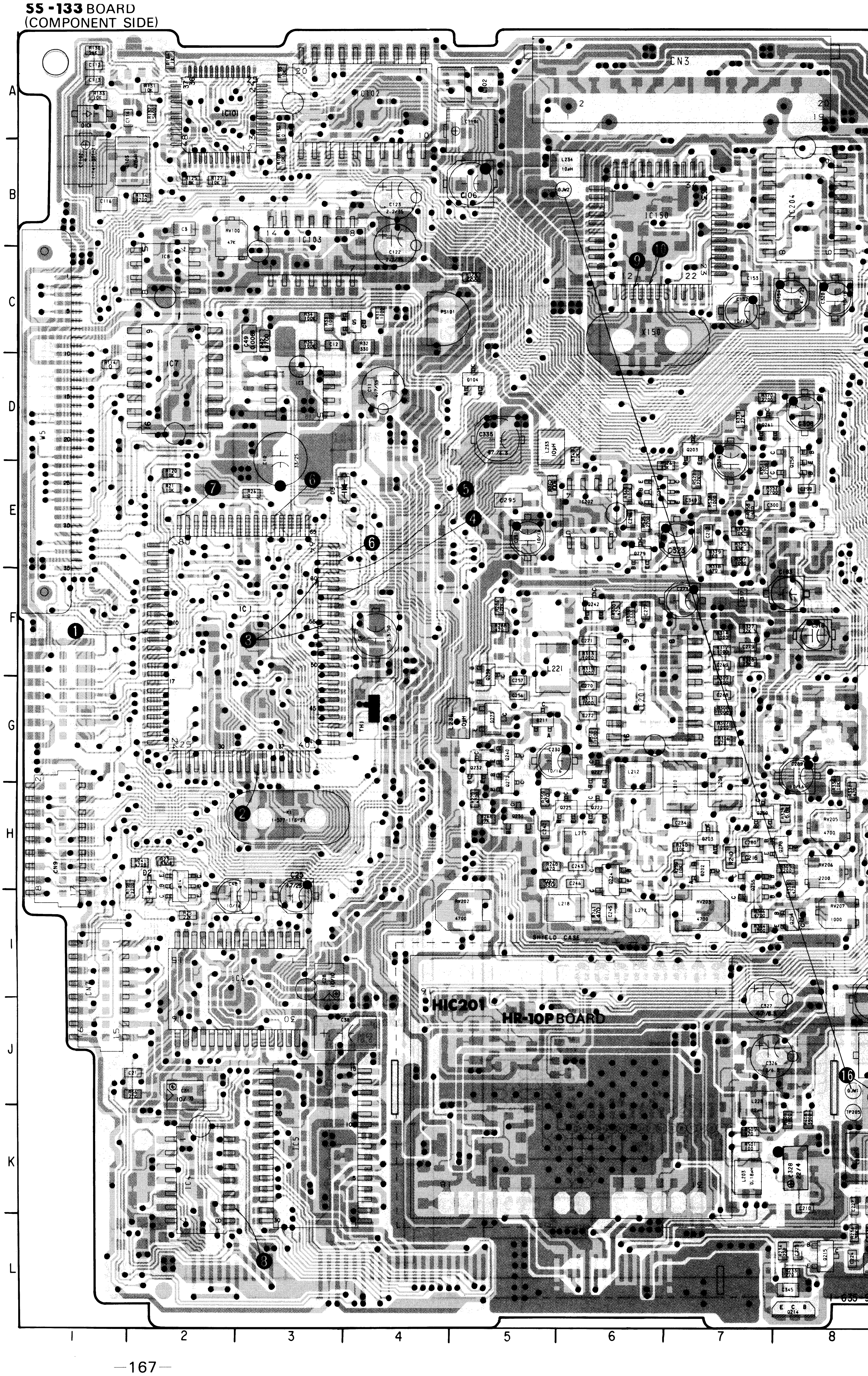
SERVO, SYSTEM CONTROL SERVO, SYSTEM CONTROL

SS-133 (SERVO, SYSTEM CONTROL, REC/PB AMP) PRINTED WIRING BOARD

—Ref. No. SS-133 BOARD : 2000 series—

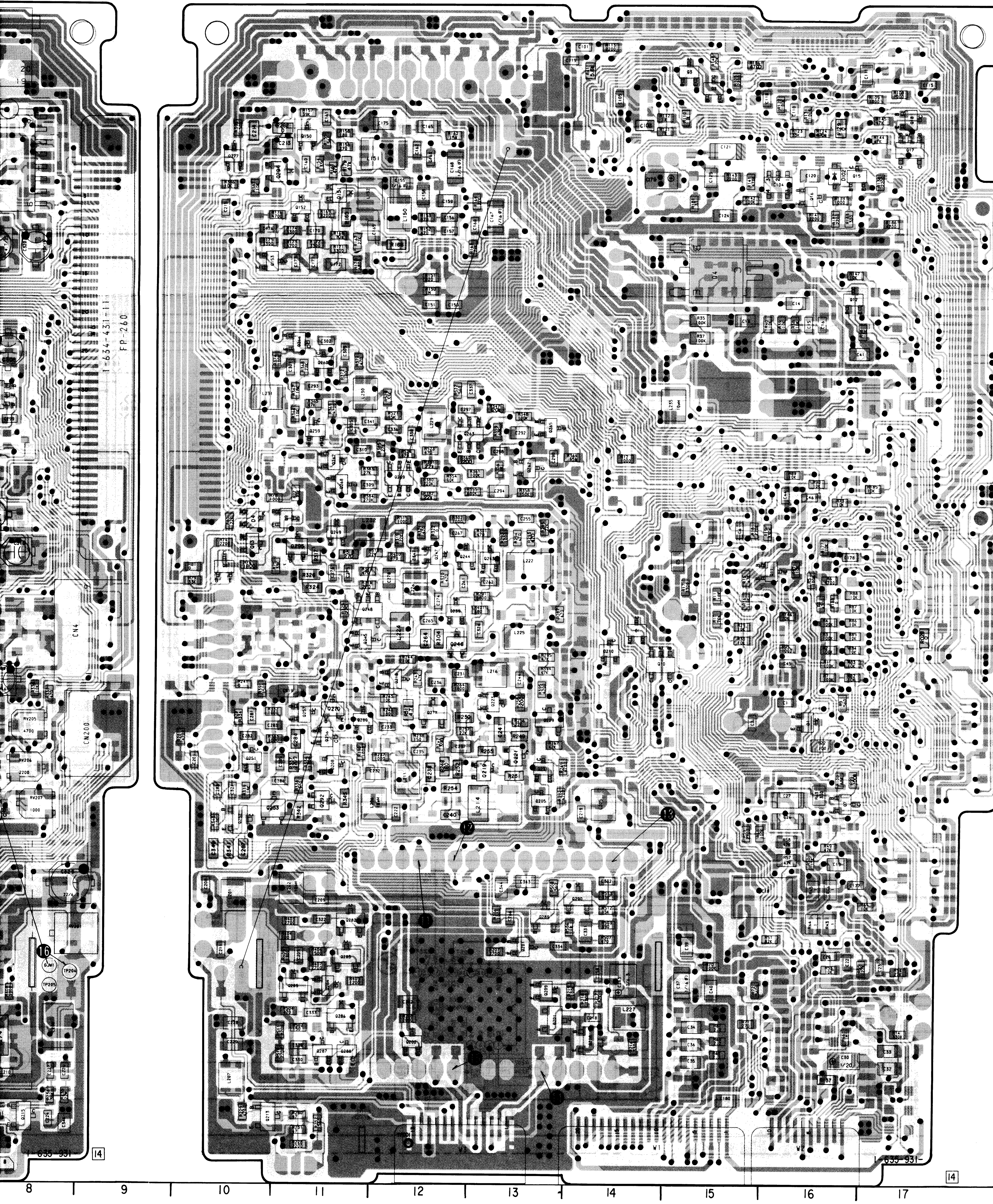
SS-133 BOARD
(SERVO, SYSTEM CONTROL)





SS-133 BOARD
(COMPONENT SIDE)
A
B
C
D
E
F
G
H
I
J
K
L
1
2
3
4
5
6
7
8
CN3
IC101
IC102
IC103
IC150
IC204
IC7
IC1
IC202
IC201
IC6
IC5
IC4
X150
PS101
TH1
CN9
CN7
HIC201
HR-10P BOARD
SHIELD CASE
L221
L233
RV100
RV205
RV206
RV207
RV202
RV203
TP205

SS-133 BOARD
(CONDUCTOR SIDE)


1-634-431-11
FP-260
CN4
CN200
1-633-931-
14
1-633-931-
14
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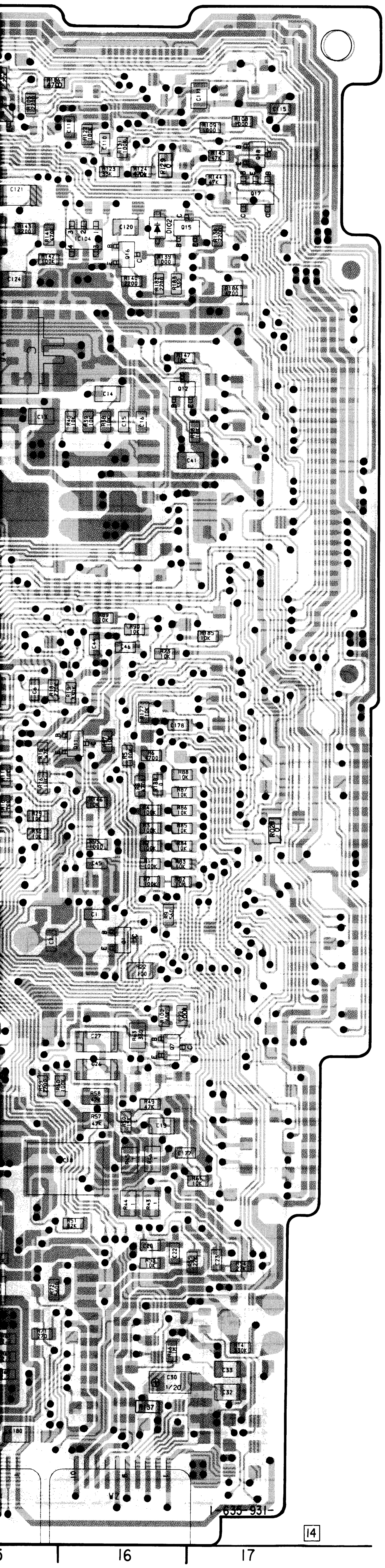


< DIODE >

D001	8-719-941-86	DAN202U
D002	8-719-404-46	MA110
D003	8-719-404-46	MA110
D004	8-719-941-86	DAN202U
D101	8-719-949-46	1T32
D102	8-719-404-46	MA110
D104	8-719-941-86	DAN202U
D201	8-719-801-41	1SS196
D202	8-719-941-86	DAN202U
D203	8-719-941-86	DAN202U
D205	8-719-941-86	DAN202U
D208	8-719-941-86	DAN202U
D210	8-719-941-86	DAN202U
D211	8-719-941-86	DAN202U

< IC >

IC001	8-752-817-79	CXP80116-828Q
IC003	8-759-998-98	LM358D
IC004	8-759-148-05	CXA8010M
IC005	8-759-805-06	CXA1127M
IC006	8-759-990-55	CXA8006M
IC007	8-759-008-95	MC14028BF
IC008	8-759-748-72	BR93C46F
IC101	8-759-970-80	MB673198U
IC102	8-759-148-62	uPD6451GT-630
IC103	8-759-420-01	AN2512S
IC104	8-759-234-20	TC7S08F
IC150	8-752-035-48	CXA1204Q
IC201	8-759-012-00	MC10H116M
IC202	8-759-998-92	LM393D
IC204	8-759-998-32	CXD2107

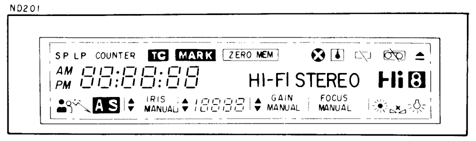
< TRANSISTOR >

Q001	8-729-907-00	DTC114EU
Q002	8-729-905-12	DTA144EU
Q003	8-729-905-18	DTC144EU
Q004	8-729-820-47	2SB1202FAT
Q005	8-729-905-35	2SC4081-R
Q007	8-729-905-35	2SC4081-R
Q008	8-729-905-35	2SC4081-R
Q009	8-729-905-35	2SC4081-R
Q010	8-729-907-03	FMG5
Q011	8-729-905-18	DTC144EU
Q012	8-729-905-18	DTC144EU
Q013	8-729-905-18	DTC144EU
Q014	8-729-822-48	FC101
Q015	8-729-905-35	2SC4081-R
Q016	8-729-905-23	2SA1576-R
Q017	8-729-907-03	FMG5
Q018	8-729-905-18	DTC144EU
Q150	8-729-905-23	2SA1576-R
Q151	8-729-905-18	DTC144EU
Q152	8-729-905-35	2SC4081-R
Q153	8-729-905-23	2SA1576-R
Q201	8-729-905-35	2SC4081-R
Q202	8-729-905-35	2SC4081-R
Q203	8-729-905-35	2SC4081-R
Q208	8-729-216-22	2SA1162
Q209	8-729-905-18	DTC144EU
Q213	8-729-216-22	2SA1162
Q214	8-729-119-76	2SA1175-HFE
Q215	8-729-216-22	2SA1162
Q217	8-729-102-07	2SC2223-F13
Q218	8-729-905-35	2SC4081-R
Q219	8-729-905-35	2SC4081-R
Q221	8-729-905-35	2SC4081-R
Q222	8-729-907-00	DTC114EU
Q223	8-729-905-35	2SC4081-R
Q224	8-729-904-07	FMG2
Q225	8-729-905-45	DTA143EU
Q227	8-729-905-35	2SC4081-R
Q229	8-729-141-48	2SB624-BV345
Q230	8-729-141-48	2SB624-BV345
Q231	8-729-905-18	DTC144EU
Q232	8-729-905-18	DTC144EU
Q238	8-729-117-31	2SC4177-L5
Q239	8-729-905-18	DTC144EU
Q240	8-729-905-18	DTC144EU
Q242	8-729-117-31	2SC4177-L5
Q243	8-729-905-18	DTC144EU
Q244	8-729-140-63	2SA1611-M5M6
Q245	8-729-117-31	2SC4177-L5
Q246	8-729-905-18	DTC144EU
Q247	8-729-905-35	2SC4081-R
Q248	8-729-903-10	FMW1
Q249	8-729-905-18	DTC144EU
Q250	8-729-905-12	DTA144EU
Q251	8-729-905-35	2SC4081-R
Q252	8-729-102-07	2SC2223-F13
Q253	8-729-320-17	2SA1122CD
Q254	8-729-905-35	2SC4081-R
Q255	8-729-904-07	FMG2
Q256	8-729-905-12	DTA144EU
Q257	8-729-905-18	DTC144EU
Q258	8-729-903-10	FMW1
Q259	8-729-905-35	2SC4081-R
Q260	8-729-905-35	2SC4081-R
Q261	8-729-905-23	2SA1576-R
Q262	8-729-905-23	2SA1576-R
Q263	8-729-907-26	IMX1
Q265	8-729-905-35	2SC4081-R
Q266	8-729-905-35	2SC4081-R
Q267	8-729-905-35	2SC4081-R
Q268	8-729-905-23	2SA1576-R
Q269	8-729-907-26	IMX1
Q270	8-729-905-12	DTA144EU
Q272	8-729-922-94	DTC143TU
Q273	8-729-141-48	2SB624-BV345
Q277	8-729-905-35	2SC4081-R
Q278	8-729-905-35	2SC4081-R
Q279	8-729-905-18	DTC144EU
Q280	8-729-905-35	2SC4081-R
Q282	8-729-102-07	2SC2223-F13
Q283	8-729-102-07	2SC2223-F13
Q284	8-729-905-35	2SC4081-R
Q285	8-729-102-07	2SC2223-F13
Q286	8-729-105-68	2SC3356-K
Q287	8-729-924-46	DTC124XU
Q288	8-729-905-12	DTA144EU
Q289	8-729-102-07	2SC2223-F13
Q290	8-729-102-07	2SC2223-F13
Q291	8-729-907-26	IMX1
Q292	8-729-905-12	DTA144EU
Q294	8-729-905-18	DTC144EU
Q295	8-729-905-35	2SC4081-R

FD-15P (MODE CONTROL) PRINTED WIRING BOARD

—Ref. No. FD-15P BOARD: 5000 series—

ND201


SP LP COUNTER
TC
MARK
ZERO MEM
AM
PM
HI-FI STEREO
Hi8
AS
IRIS MANUAL
GAIN MANUAL
FOCUS MANUAL

< DIODE >

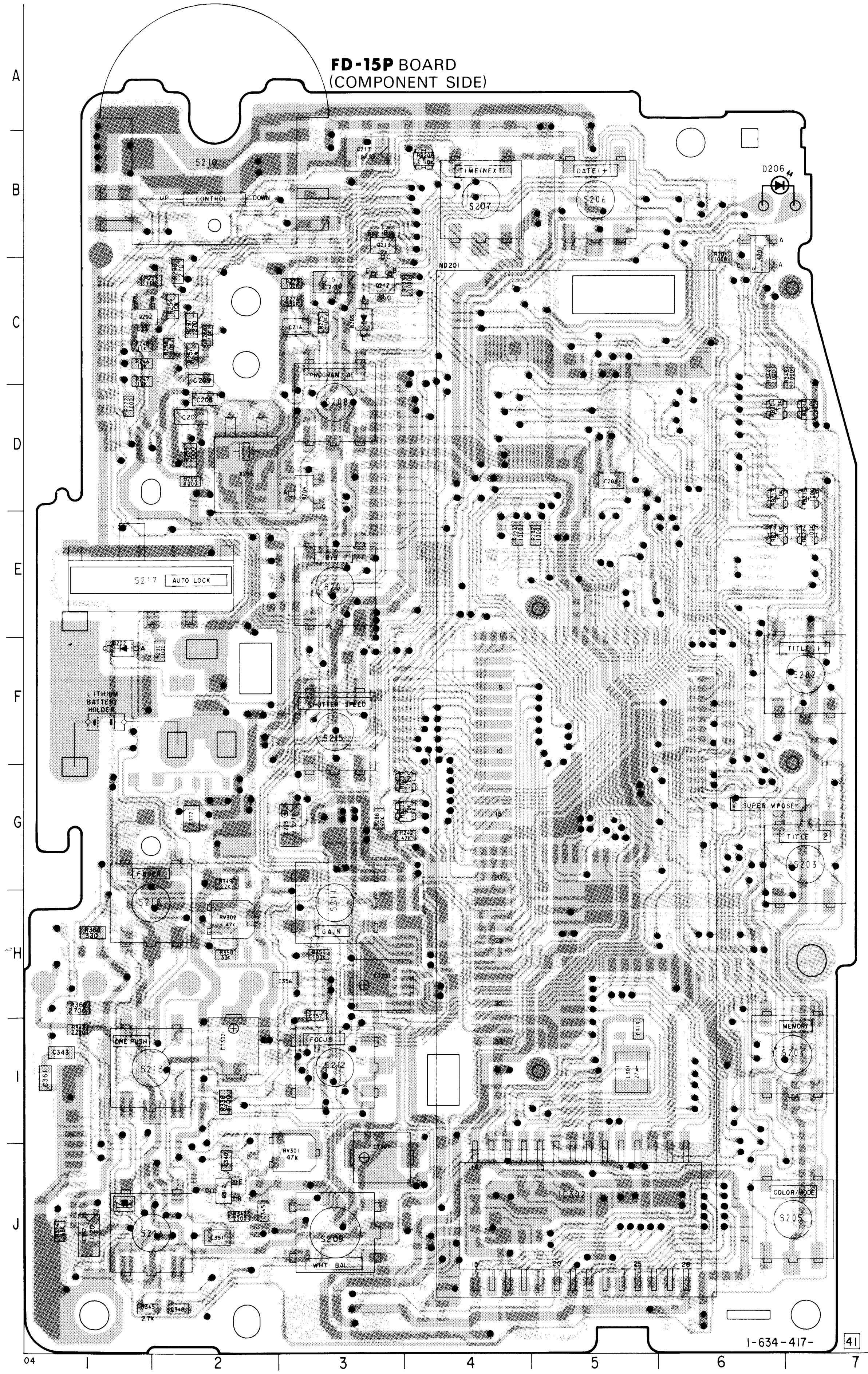
D201	8-719-940-45	DWA010
D202	8-719-404-46	MA110
D203	8-719-938-72	SB01-05CP
D204	8-719-420-36	MA151A
D205	8-719-404-46	MA110
D206	8-719-812-41	TLR124, RED

< IC >

IC201	8-759-152-41	uPD75316GF
IC202	8-759-999-02	TL1596CDB
IC203	8-759-145-63	uPD7564G-540
IC205	8-759-937-54	S-81250HG-RD-S
IC206	8-759-937-56	S-8054ALB-LM-S
IC301	8-759-998-30	CF79028PG
IC302	8-752-336-66	CXK58257M-10L
IC303	8-752-039-49	CXA1393AN
IC304	8-759-634-47	M51285BGP

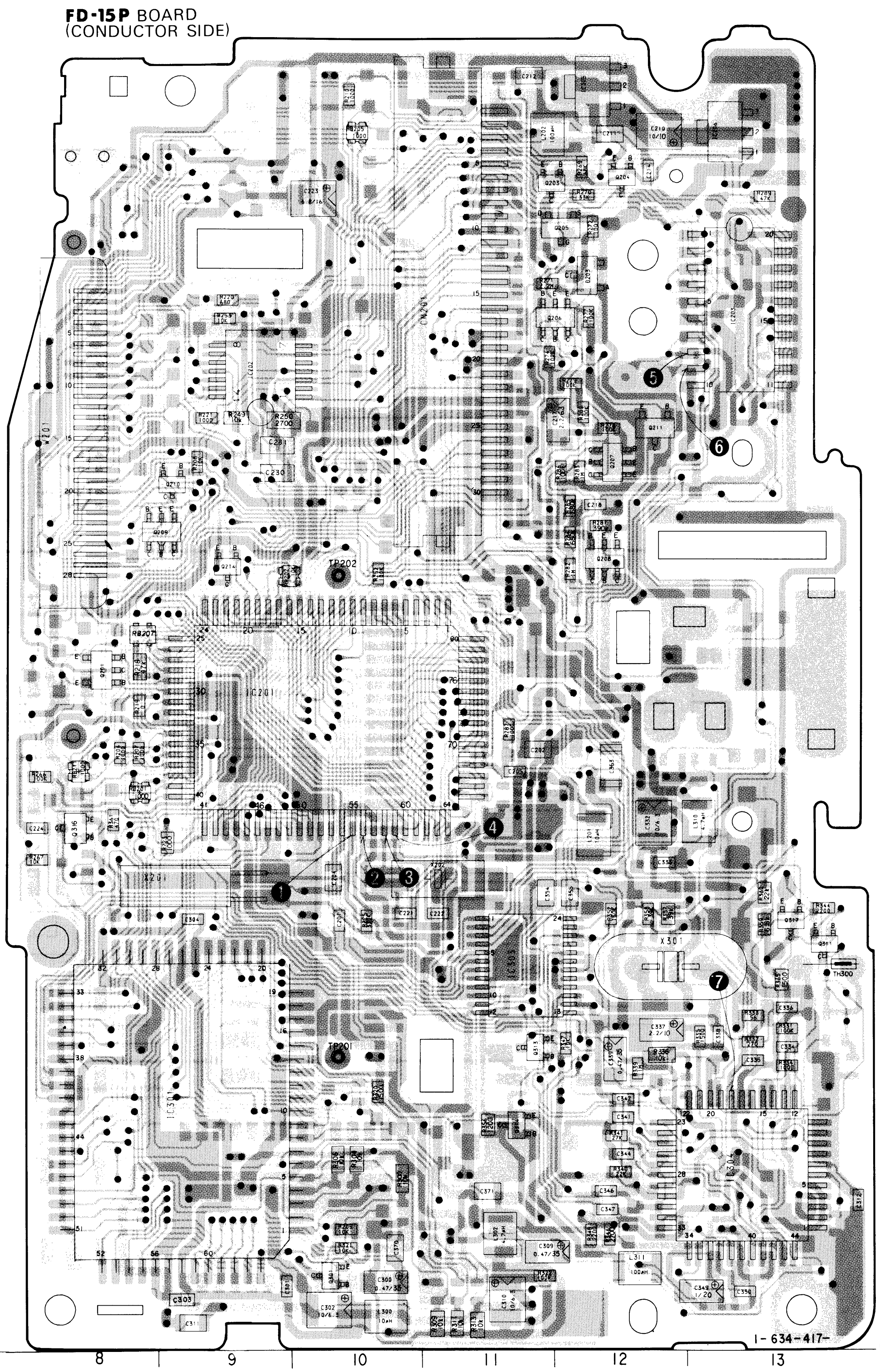
< TRANSISTOR >

Q201	8-729-904-20	FMA2
Q202	8-729-905-18	DTC144EU
Q203	8-729-905-24	2SA1576-S
Q204	8-729-905-15	DTC144WU
Q205	8-729-109-44	2SK94
Q206	8-729-402-78	XN6401
Q207	8-729-402-19	XN6501
Q208	8-729-402-78	XN6401
Q209	8-729-403-10	XN6215
Q210	8-729-905-XX	DTC114TU
Q211	8-729-100-66	2SC1623
Q212	8-729-905-XX	DTC114TU
Q213	8-729-905-18	DTC144EU
Q214	8-729-905-12	DTA144EU
Q301	8-729-925-91	DTC115EU
Q311	8-729-905-35	2SC4081-R
Q312	8-729-905-35	2SC4081-R
Q313	8-729-905-18	DTC144EU
Q314	8-729-905-35	2SC4081-R
Q316	8-729-905-12	DTA144EU
Q317	8-729-905-24	2SA1576-S



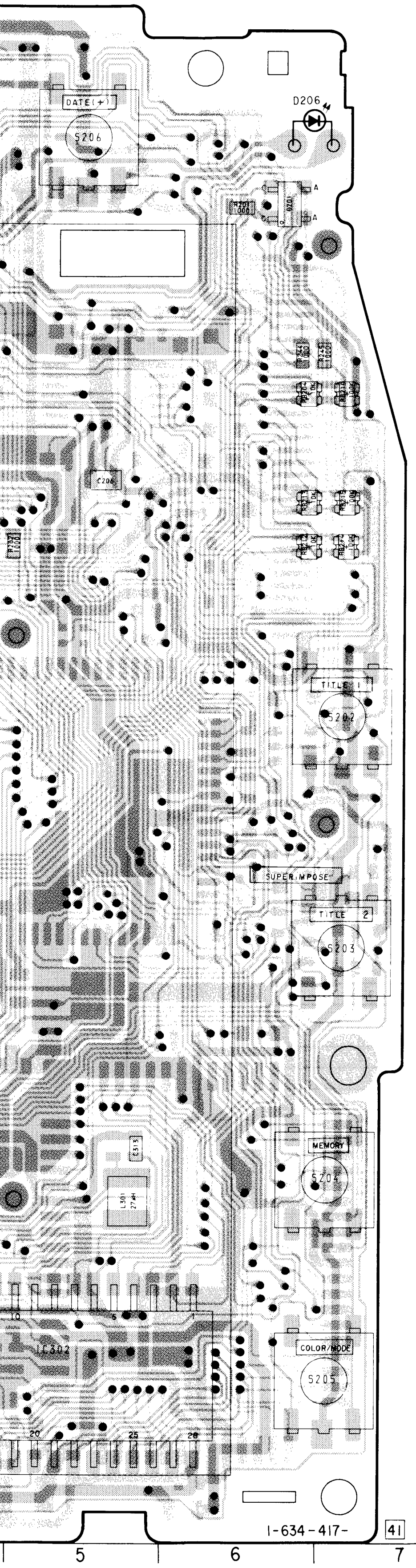
FD-15P BOARD (COMPONENT SIDE)

A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
04
S210
UP
CONTROL
DOWN
TIME(NEXT)
DATE(+)
S207
S206
D206
ND201
PROGRAM AE
S208
S217
AUTO LOCK
S201
LITHIUM BATTERY HOLDER
SHUTTER SPEED
S215
TITLE 1
S202
SUPER IMPOSE
TITLE 2
S203
FADER
S213
S211
GAIN
RV302
ONE PUSH
S218
FOCUS
S212
MEMORY
S204
RV301
COLOR/MODE
S205
S214
S209
WHT BAL
IC302
1-634-417-
41



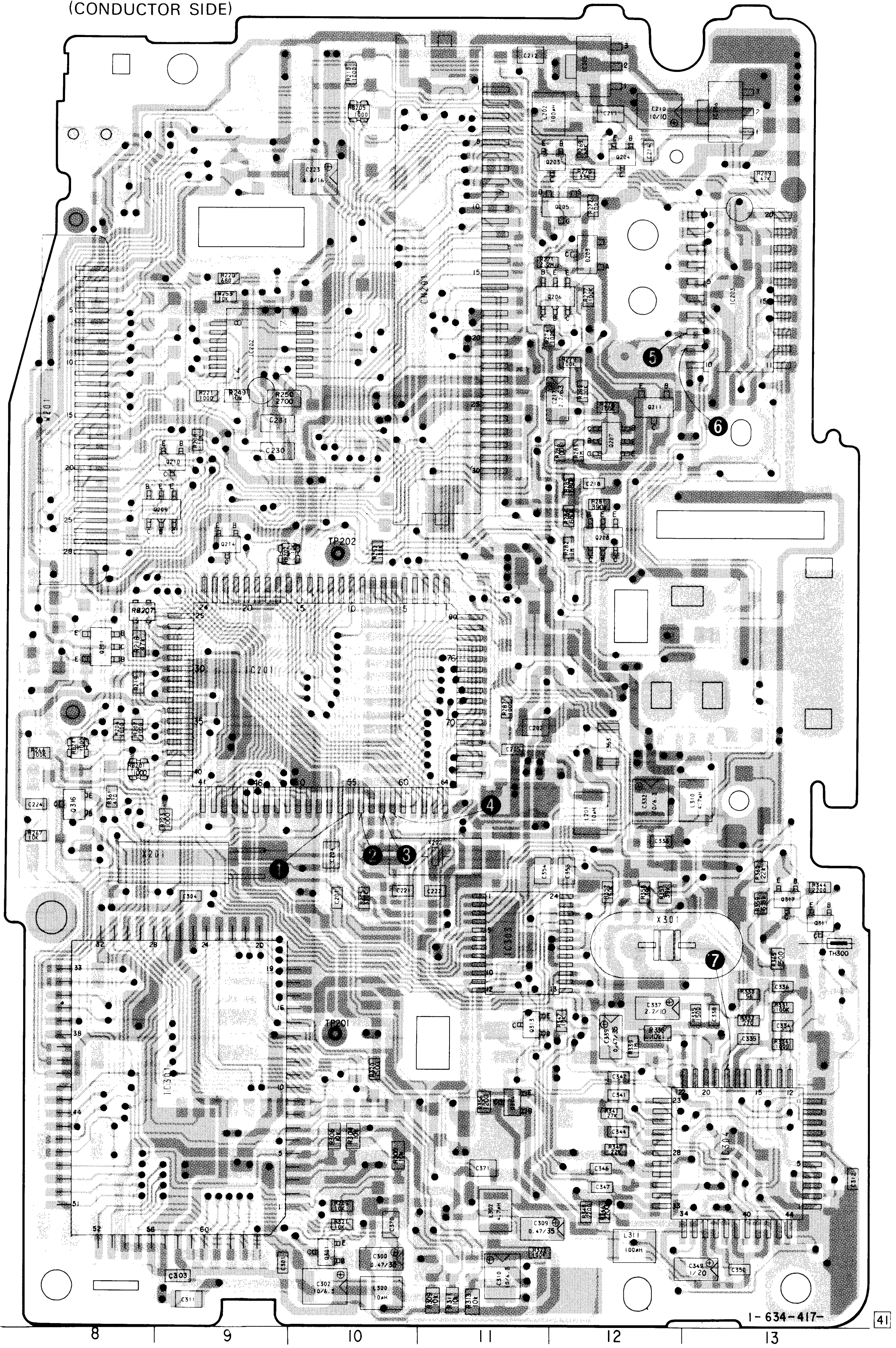
FD-15P BOARD (CONDUCTOR SIDE)

IC201
IC202
IC301
X301
TP201
TP202
1
2
3
4
5
6
7
8
9
10
11
12
13
1-634-417-
41



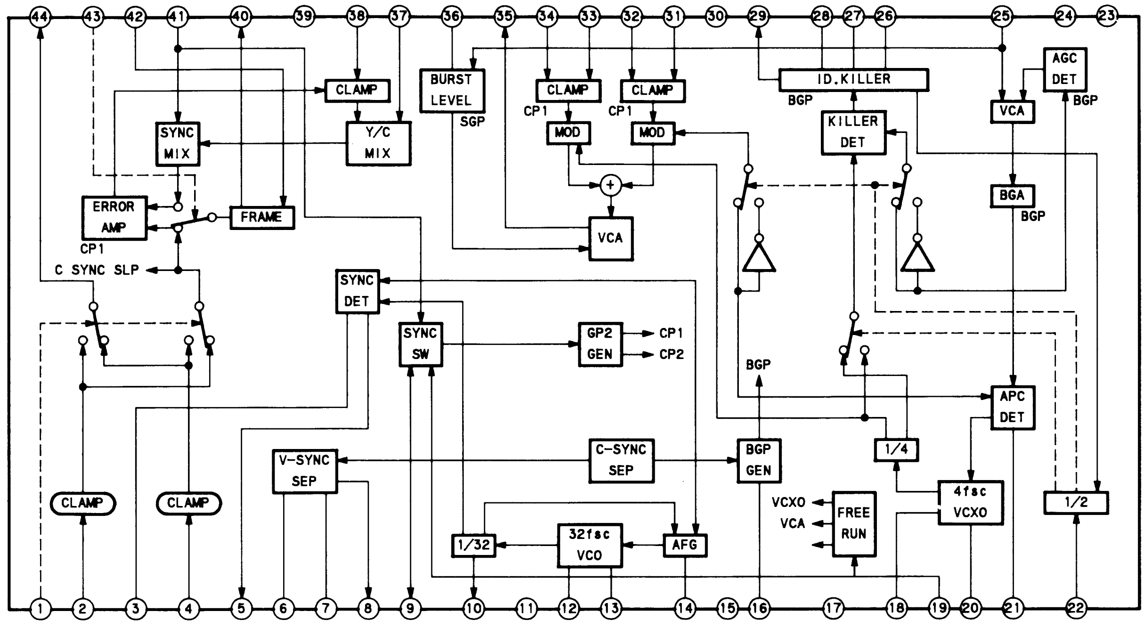
D206
DATE(+1)
S206
TITLE 1
S202
SUPER IMPOSE
TITLE 2
S203
MEMORY
S204
COLOR/MODE
S205
IC202
1-634-417-
41
5
6
7

FD-15P BOARD
(CONDUCTOR SIDE)



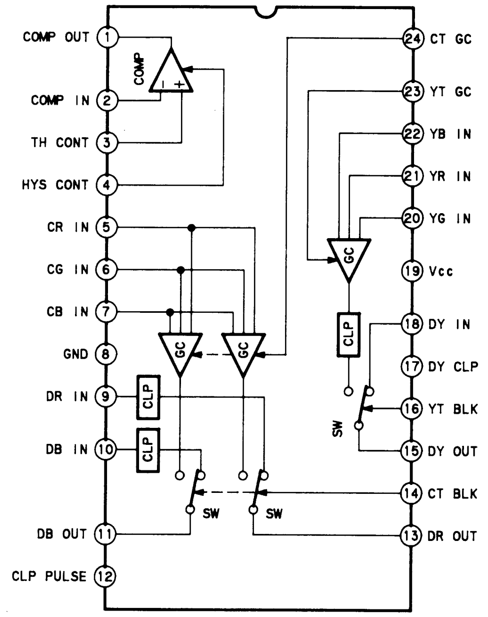
IC201
TP202
TP201
X301
TH300
❶
❷
❸
❹
❺
❻
❼
1-634-417-
41
8
9
10
11
12
13

FD-15P BOARD IC304 M51285BGP



CLAMP
Y/C MIX
SYNC MIX
ERROR AMP
CP1
FRAME
C SYNC SLP
BURST LEVEL
SGP
CLAMP
CLAMP
CP1
CP1
MOD
MOD
VCA
ID.KILLER
BGP
KILLER DET
VCA
AGC DET
BGP
BGA
BGP
SYNC DET
SYNC SW
GP2 GEN
CP1
CP2
BGP
APC DET
V-SYNC SEP
C-SYNC SEP
BGP GEN
1/4
CLAMP
CLAMP
1/32
32fsc VCO
AFG
VCXO
VCA
FREE RUN
4fsc VCXO
1/2

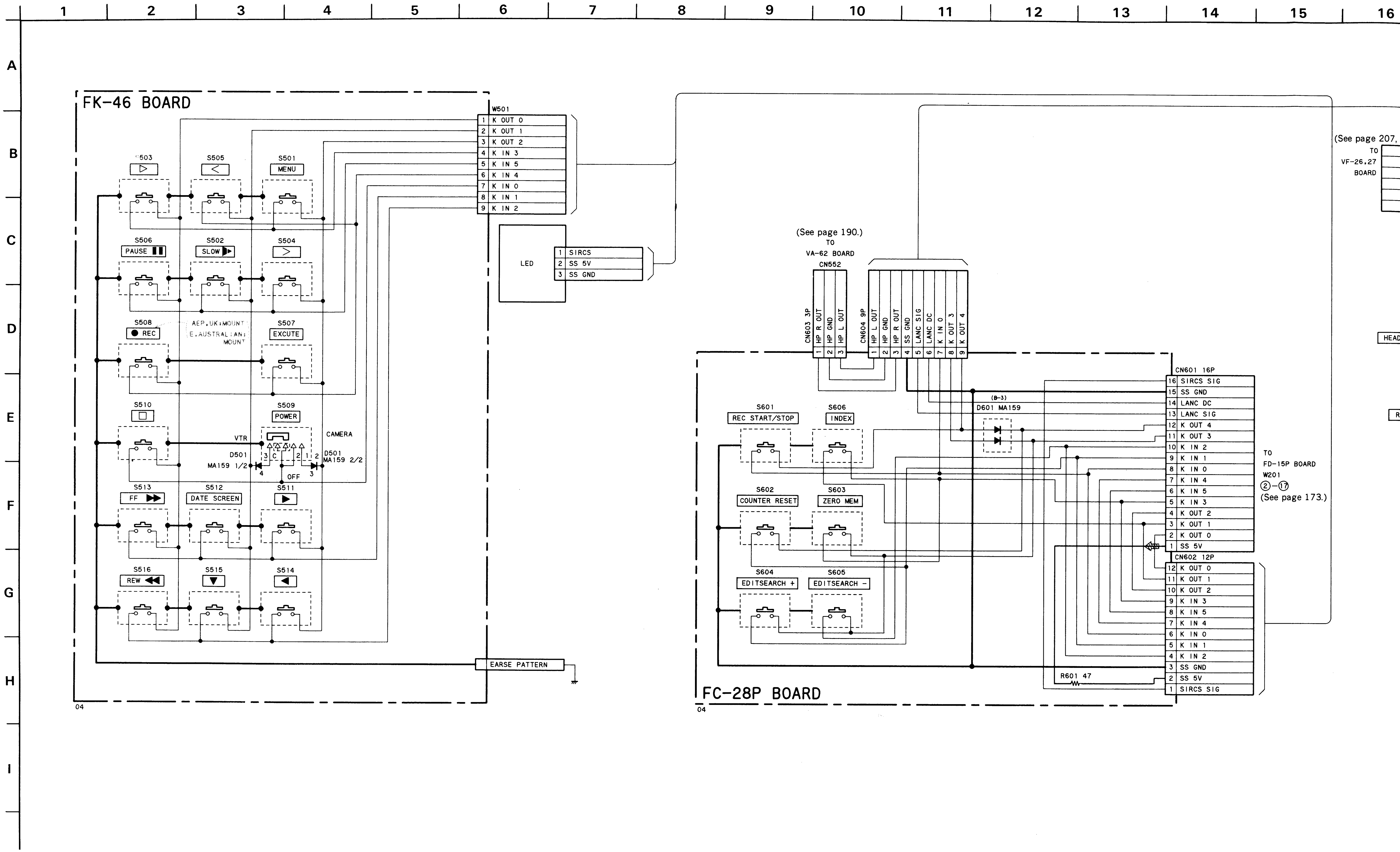
FD-15P BOARD IC303 CXA1393



COMP OUT 1
COMP IN 2
TH CONT 3
HYS CONT 4
CR IN 5
CG IN 6
CB IN 7
GND 8
DR IN 9
DB IN 10
DB OUT 11
CLP PULSE 12
24 CT GC
23 YT GC
22 YB IN
21 YR IN
20 YG IN
19 Vcc
18 DY IN
17 DY CLP
16 YT BLK
15 DY OUT
14 CT BLK
13 DR OUT
COMP
GC
GC
GC
CLP
CLP
CLP
SW
SW
SW

FK-46 (FUNCTION SWITCH), FC-28P (FUNCTION SWITCH), SW-120P (REC START/STOP, STANDBY SWITCH) SCHEMATIC DIAGRAM

—Ref. No. FK-46 BOARD : 3000 series, FC-28P, SW-120P BOARDS : 7000 series—



1
2
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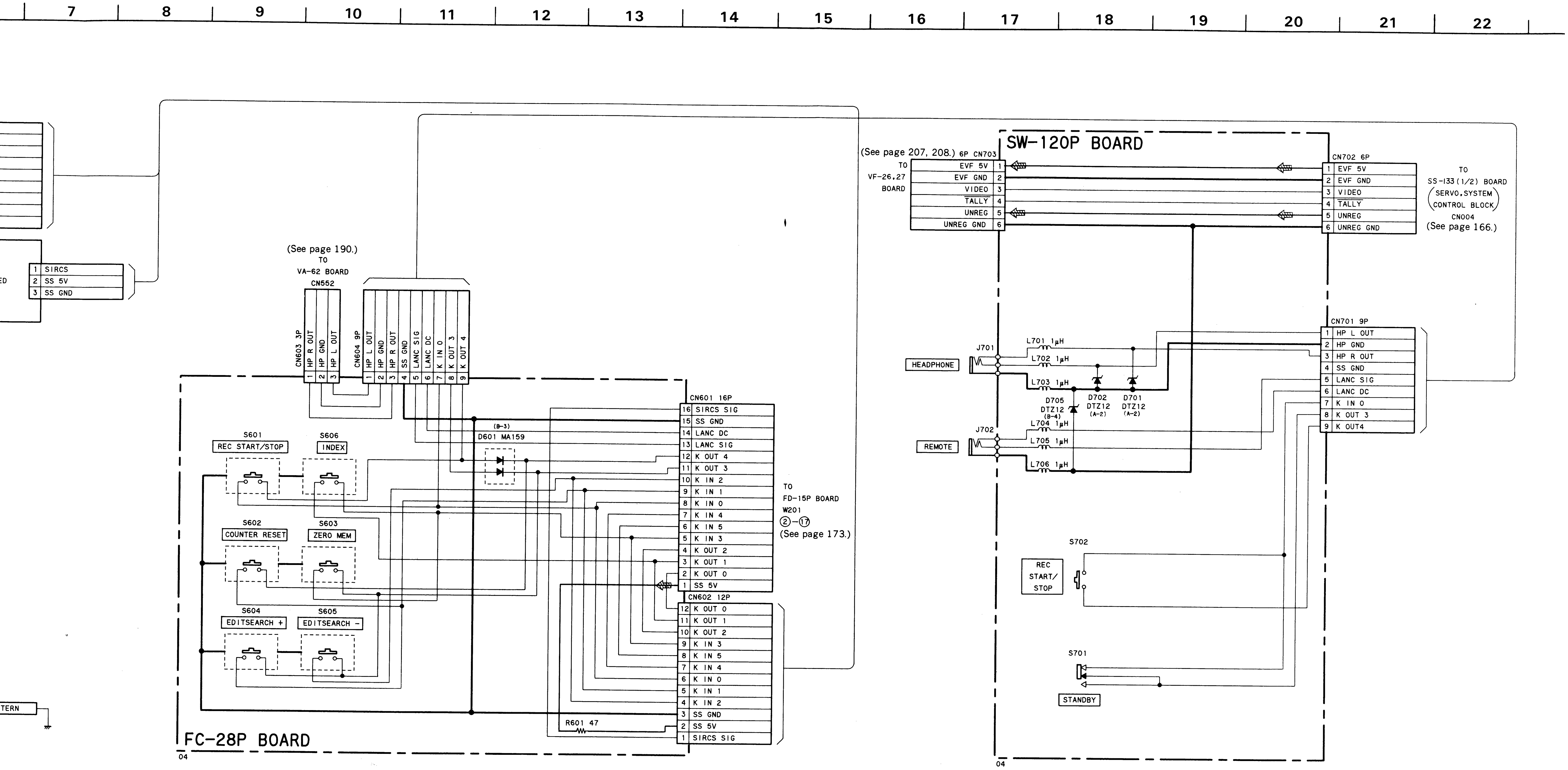
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
FK-46 BOARD
S503
S505
S501
MENU
S506
PAUSE
S502
SLOW
S504
S508
REC
AEP,UK:MOUNT
E.AUSTRALIAN:
MOUNT
S507
EXCUTE
S510
S509
POWER
CAMERA
VTR
D501
MA159 1/2
D501
MA159 2/2
OFF
S513
FF
S512
DATE SCREEN
S511
S516
REW
S515
S514
W501
1 K OUT 0
2 K OUT 1
3 K OUT 2
4 K IN 3
5 K IN 5
6 K IN 4
7 K IN 0
8 K IN 1
9 K IN 2
LED
1 SIRCS
2 SS 5V
3 SS GND
EARSE PATTERN
04
(See page 190.)
TO
VA-62 BOARD
CN552
CN603 3P
1 HP R OUT
2 HP GND
3 HP L OUT
CN604 9P
1 HP L OUT
2 HP GND
3 HP R OUT
4 SS GND
5 LANC SIG
6 LANC DC
7 K IN 0
8 K OUT 3
9 K OUT 4
S601
REC START/STOP
S606
INDEX
(B-3)
D601 MA159
S602
COUNTER RESET
S603
ZERO MEM
S604
EDITSEARCH +
S605
EDITSEARCH −
CN601 16P
16 SIRCS SIG
15 SS GND
14 LANC DC
13 LANC SIG
12 K OUT 4
11 K OUT 3
10 K IN 2
9 K IN 1
8 K IN 0
7 K IN 4
6 K IN 5
5 K IN 3
4 K OUT 2
3 K OUT 1
2 K OUT 0
1 SS 5V
CN602 12P
12 K OUT 0
11 K OUT 1
10 K OUT 2
9 K IN 3
8 K IN 5
7 K IN 4
6 K IN 0
5 K IN 1
4 K IN 2
3 SS GND
2 SS 5V
1 SIRCS SIG
R601 47
TO
FD-15P BOARD
W201
②-⑰
(See page 173.)
(See page 207,
TO
VF-26,27
BOARD
HEAD
R
FC-28P BOARD
04

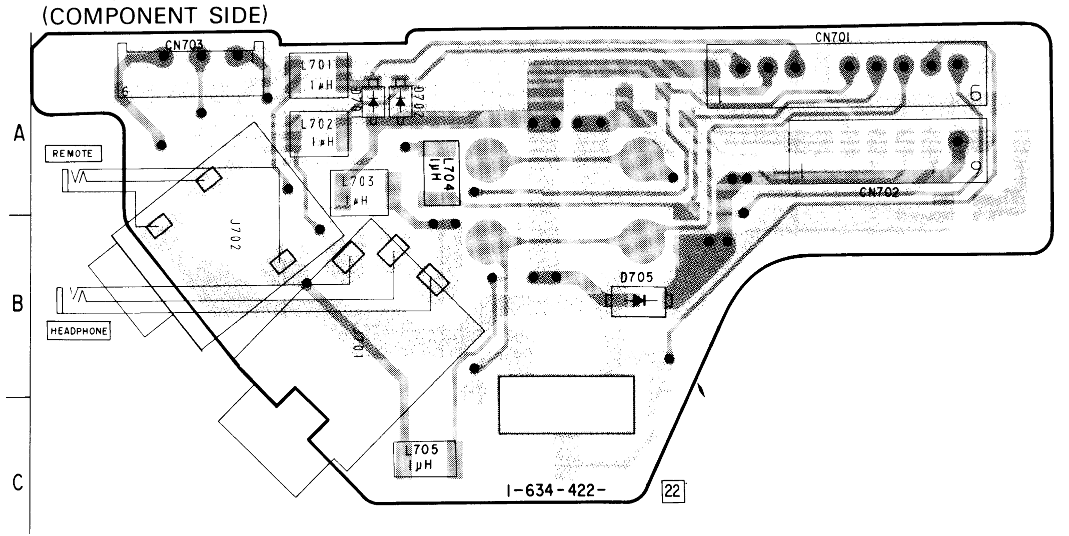
STANDBY SWITCH) SCHEMATIC DIAGRAM


7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
1 SIRCS
2 SS 5V
3 SS GND
ED
TERN
(See page 190.)
TO
VA-62 BOARD
CN552
CN603 3P
1 HP R OUT
2 HP GND
3 HP L OUT
CN604 9P
1 HP L OUT
2 HP GND
3 HP R OUT
4 SS GND
5 LANC SIG
6 LANC DC
7 K IN 0
8 K OUT 3
9 K OUT 4
CN601 16P
16 SIRCS SIG
15 SS GND
14 LANC DC
13 LANC SIG
12 K OUT 4
11 K OUT 3
10 K IN 2
9 K IN 1
8 K IN 0
7 K IN 4
6 K IN 5
5 K IN 3
4 K OUT 2
3 K OUT 1
2 K OUT 0
1 SS 5V
CN602 12P
12 K OUT 0
11 K OUT 1
10 K OUT 2
9 K IN 3
8 K IN 5
7 K IN 4
6 K IN 0
5 K IN 1
4 K IN 2
3 SS GND
2 SS 5V
1 SIRCS SIG
TO
FD-15P BOARD
W201
②-⑰
(See page 173.)
(B-3)
D601 MA159
S601
REC START/STOP
S606
INDEX
S602
COUNTER RESET
S603
ZERO MEM
S604
EDITSEARCH +
S605
EDITSEARCH −
R601 47
FC-28P BOARD
04
(See page 207, 208.) 6P CN703
TO
VF-26,27
BOARD
EVF 5V 1
EVF GND 2
VIDEO 3
TALLY 4
UNREG 5
UNREG GND 6
SW-120P BOARD
CN702 6P
1 EVF 5V
2 EVF GND
3 VIDEO
4 TALLY
5 UNREG
6 UNREG GND
TO
SS-133(1/2) BOARD
(SERVO,SYSTEM CONTROL BLOCK)
CN004
(See page 166.)
CN701 9P
1 HP L OUT
2 HP GND
3 HP R OUT
4 SS GND
5 LANC SIG
6 LANC DC
7 K IN 0
8 K OUT 3
9 K OUT4
J701
HEADPHONE
L701 1μH
L702 1μH
L703 1μH
D705
DTZ12
(B-4)
D702
DTZ12
(A-2)
D701
DTZ12
(A-2)
J702
REMOTE
L704 1μH
L705 1μH
L706 1μH
S702
REC
START/
STOP
S701
STANDBY
04

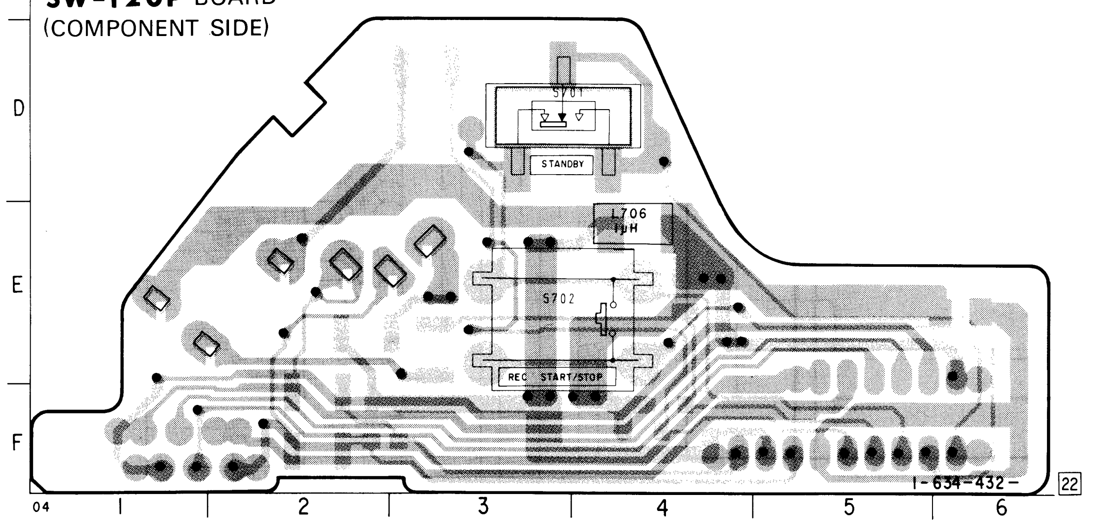
FK-46 (FUNCTION SWITCH), FC-28P (FUNCTION SWITCH), SW-120P (REC START/STOP, STANDBY SWITCH) PRINTED WIRING BOARD

—Ref. No. FK-46 BOARD : 3000 series, FC-28P, SW-120P BOARDS : 7000 series—

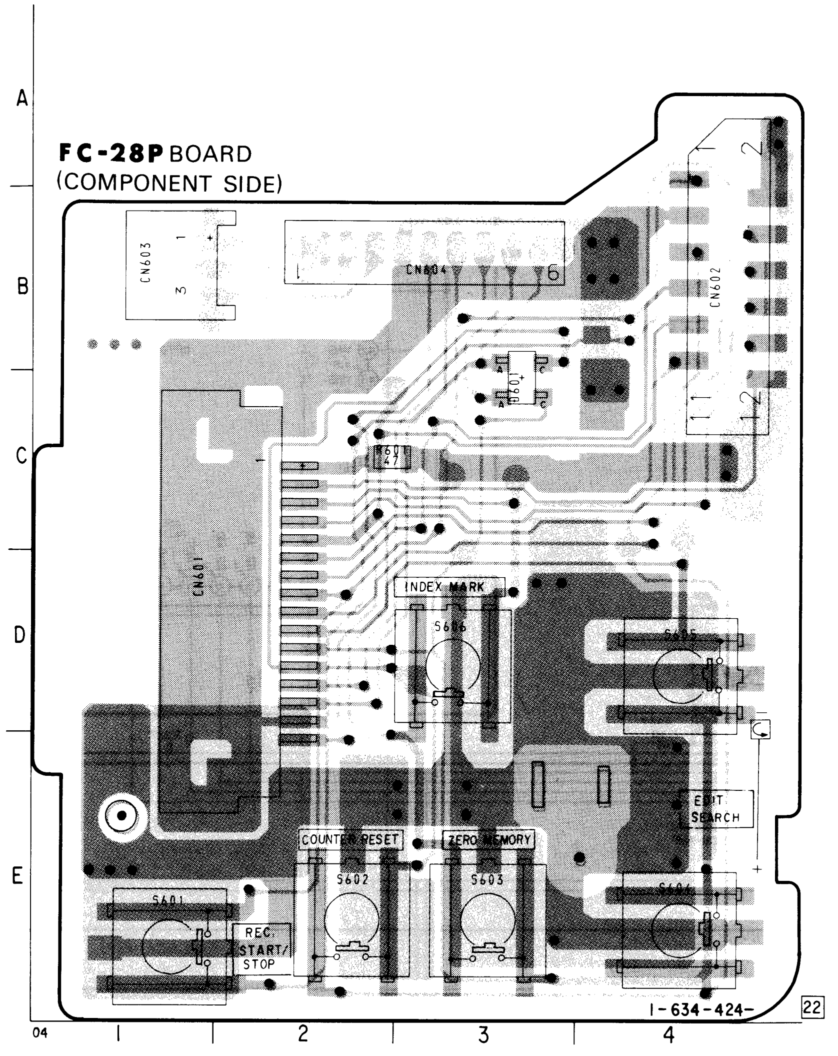
SW-120P BOARD
(COMPONENT SIDE)


CN703
L701 1μH
L702 1μH
D704
D702
CN701
6
9
L703 1μH
L704 1μH
CN702
REMOTE
J702
D705
HEADPHONE
L705 1μH
1-634-422-
22
A
B
C

SW-120P BOARD
(COMPONENT SIDE)

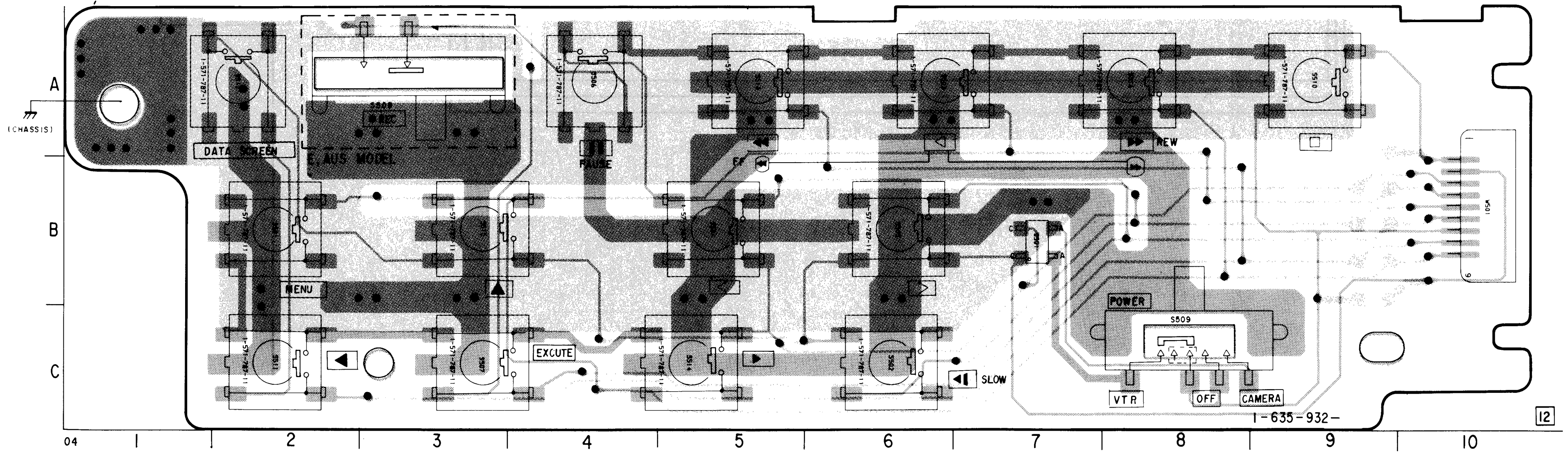

S701
STANDBY
L706 1μH
S702
REC START/STOP
1-634-432-
22
D
E
F
04
1
2
3
4
5
6

FC-28P BOARD
(COMPONENT SIDE)


A
B
C
D
E
CN603
1
3
CN604
1
6
CN602
1
2
11
12
D601
R601 47
CN601
INDEX MARK
S606
S605
EDIT SEARCH
COUNTER RESET
ZERO MEMORY
S602
S603
S604
S601
REC START/STOP
1-634-424-
22
04
1
2
3
4

< DIODE >
D601 8-719-940-45 DWA010

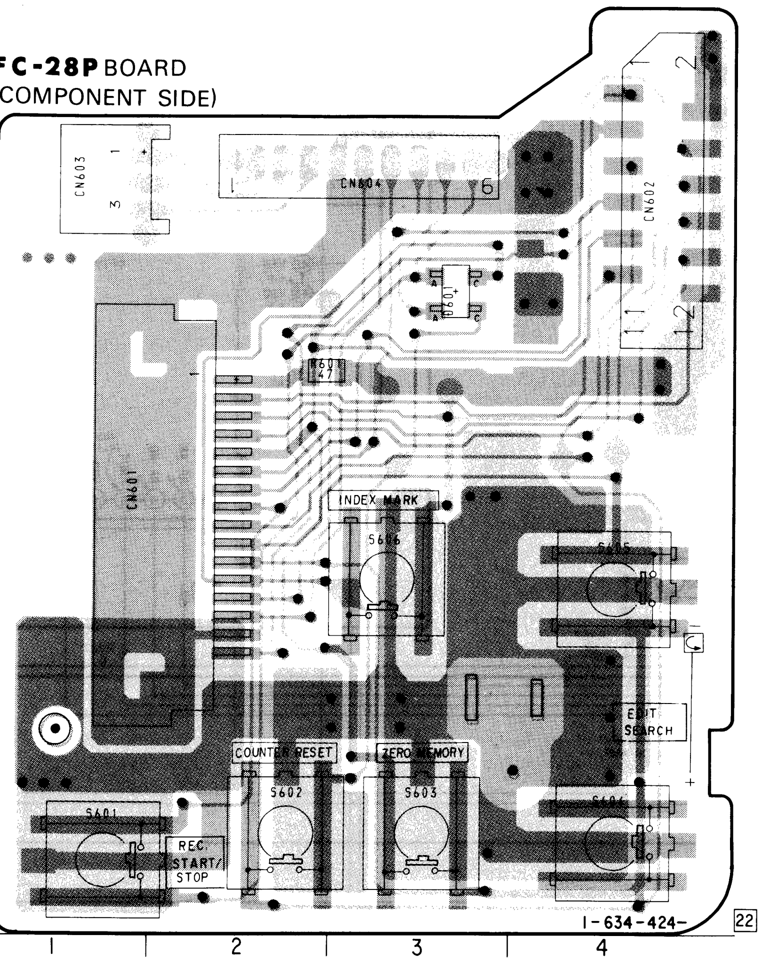
FK-46 BOARD
(CONDUCTOR SIDE)


A
B
C
(CHASSIS)
S508
DATA SCREEN
E.AUS MODEL
PAUSE
FF
REW
MENU
EXCUTE
SLOW
POWER
S509
VTR
OFF
CAMERA
1-635-932-
12
04
1
2
3
4
5
6
7
8
9
10

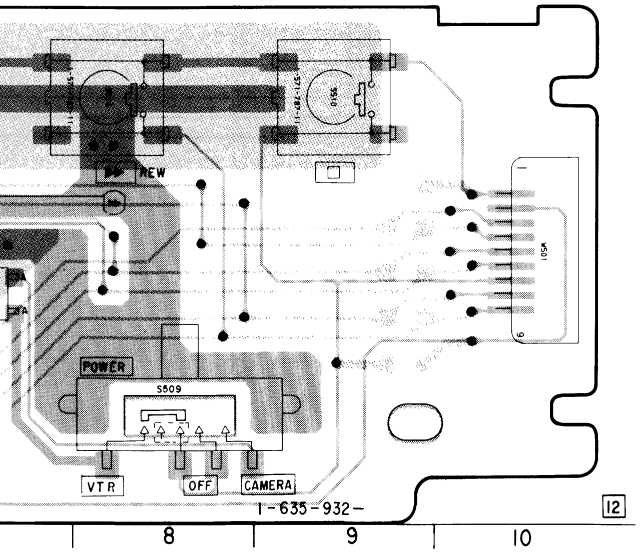
< DIODE >
D501 8-719-940-45 DWA010

SWITCH) PRINTED WIRING BOARD

C-28P BOARD
COMPONENT SIDE)


CN603
1
3
CN604
6
CN602
1
2
11
12
D601
R601
47
CN601
INDEX MARK
S606
S605
EDIT
SEARCH
COUNTER RESET
ZERO MEMORY
S602
S603
S601
REC.
START/
STOP
S604
1-634-424-
22
1
2
3
4

< DIODE >
D601 8-719-940-45 DWA010


REW
S510
POWER
S509
VTR
OFF
CAMERA
1-635-932-
12
8
9
10

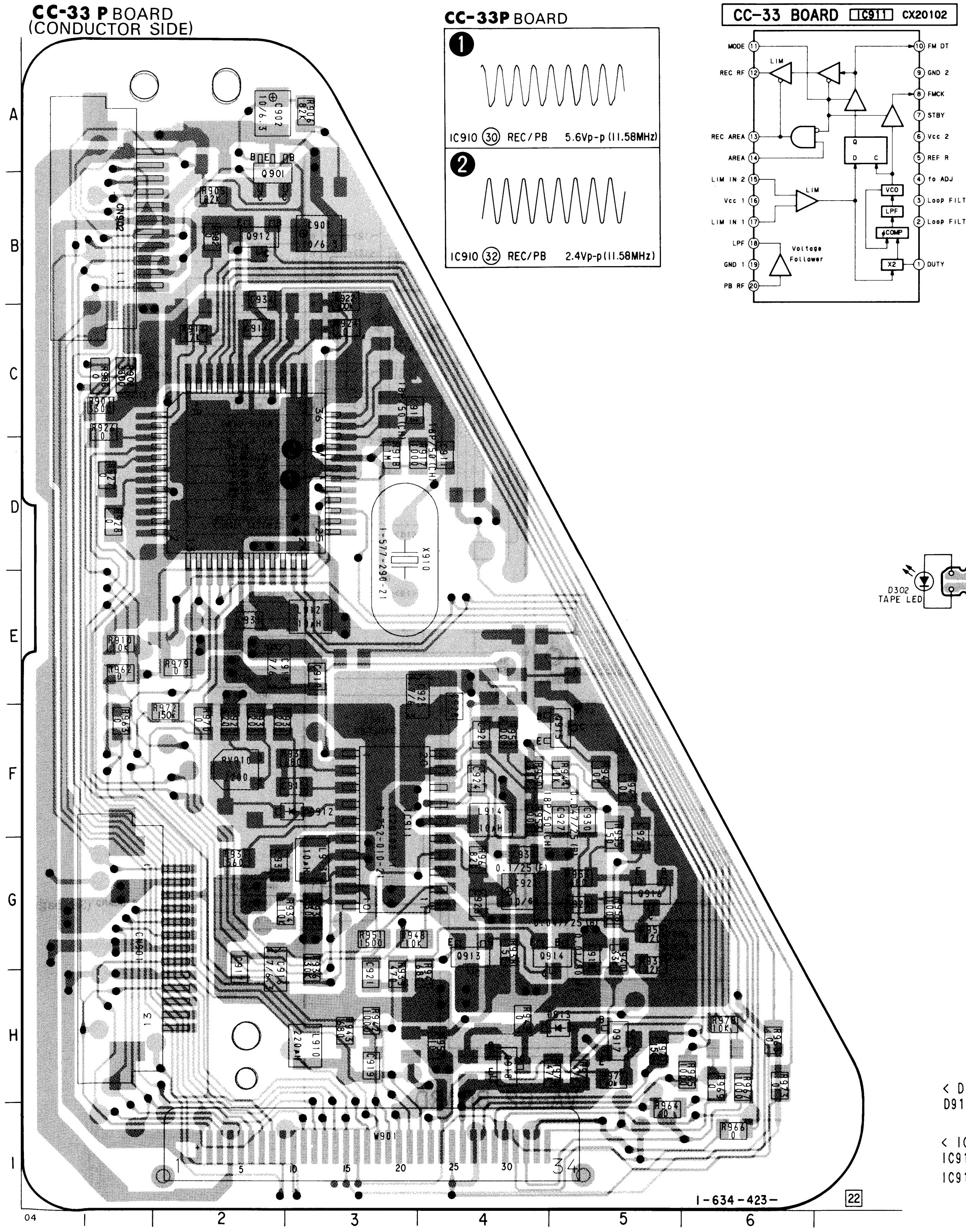
< DIODE >
D501 8-719-940-45 DWA010

FUNCTION

CC-33P (INDEX), FP-89 (MODE SWITCH, SENSOR), FP-90 (TAPE SELECT SWITCH SENSOR) PRINTED WIRING BOARD

—Ref. No. CC-33P BOARD : 6000 series, FP-89, FP-90 BOARDS : 7000 series—

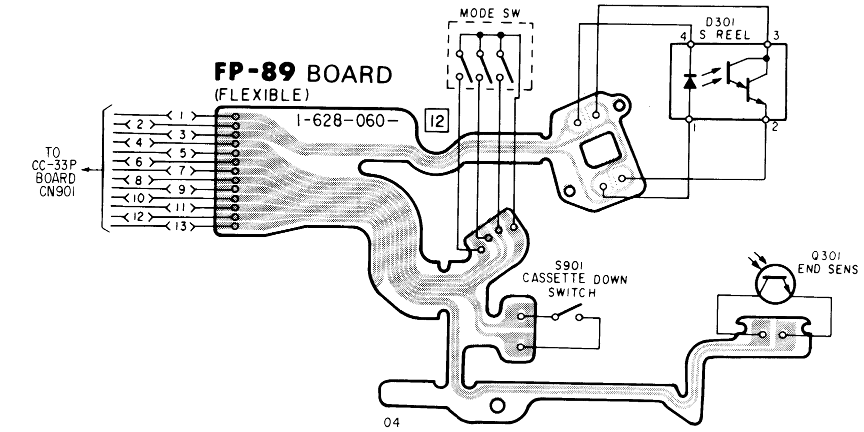
CC-33 P BOARD
(CONDUCTOR SIDE)


A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
04
Q901
Q912
Q913
Q914
X910
1-577-290-21
W901
1-634-423-
22

CC-33P BOARD

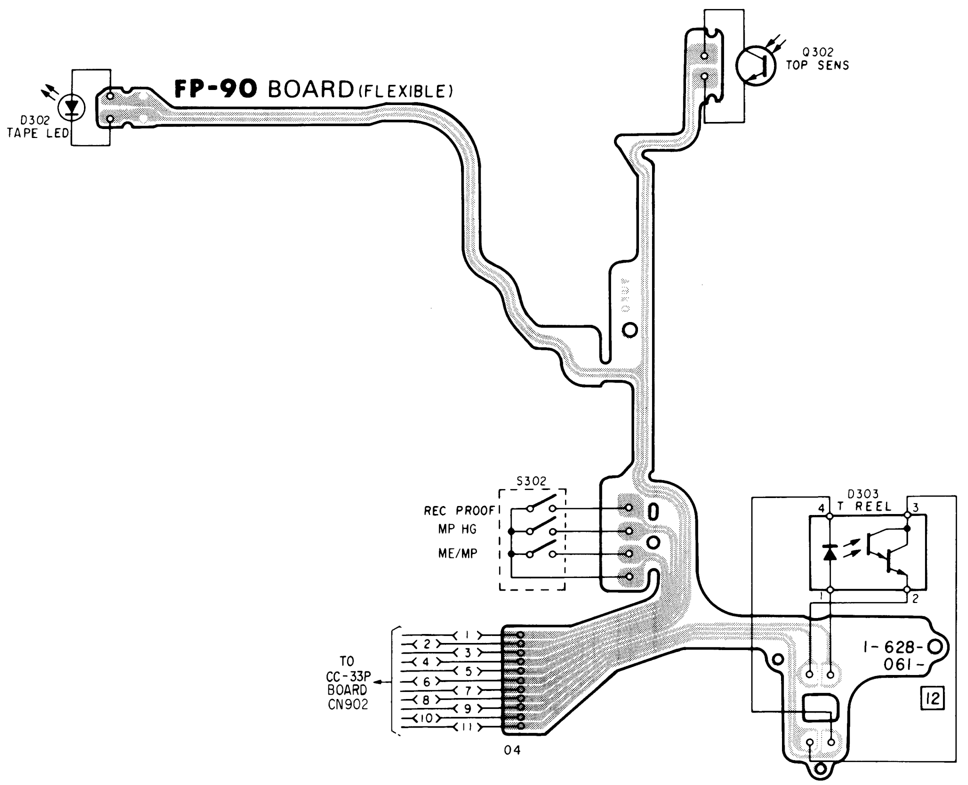
❶
IC910 ㉚ REC/PB 5.6Vp-p (11.58MHz)
❷
IC910 ㉜ REC/PB 2.4Vp-p (11.58MHz)

CC-33 BOARD IC911 CX20102
MODE 11
REC RF 12
REC AREA 13
AREA 14
LIM IN 2 15
Vcc 1 16
LIM IN 1 17
LPF 18
GND 1 19
PB RF 20
10 FM DT
9 GND 2
8 FMCK
7 STBY
6 Vcc 2
5 REF R
4 fo ADJ
3 Loop FILTER 2
2 Loop FILTER 1
1 DUTY
LIM
LIM
Q
D
C
VCO
LPF
φCOMP
X2
Voltage Follower


FP-89 BOARD
(FLEXIBLE)
1-628-060-
12
TO CC-33P BOARD CN901
MODE SW
D301 S REEL
S901 CASSETTE DOWN SWITCH
Q301 END SENS
04

< DIODE >		
D301	8-719-801-55	TLP907-0

< TRANSISTOR >		
Q301	8-729-906-48	EE-TP109


FP-90 BOARD (FLEXIBLE)
D302 TAPE LED
Q302 TOP SENS
S302
REC PROOF
MP HG
ME/MP
D303 T REEL
TO CC-33P BOARD CN902
1-628-061-
12
04

< DIODE >		
D302	8-719-801-55	TLP907-0
D303	8-719-940-81	GL-452S

< TRANSISTOR >		
Q302	8-729-906-48	EE-TP109

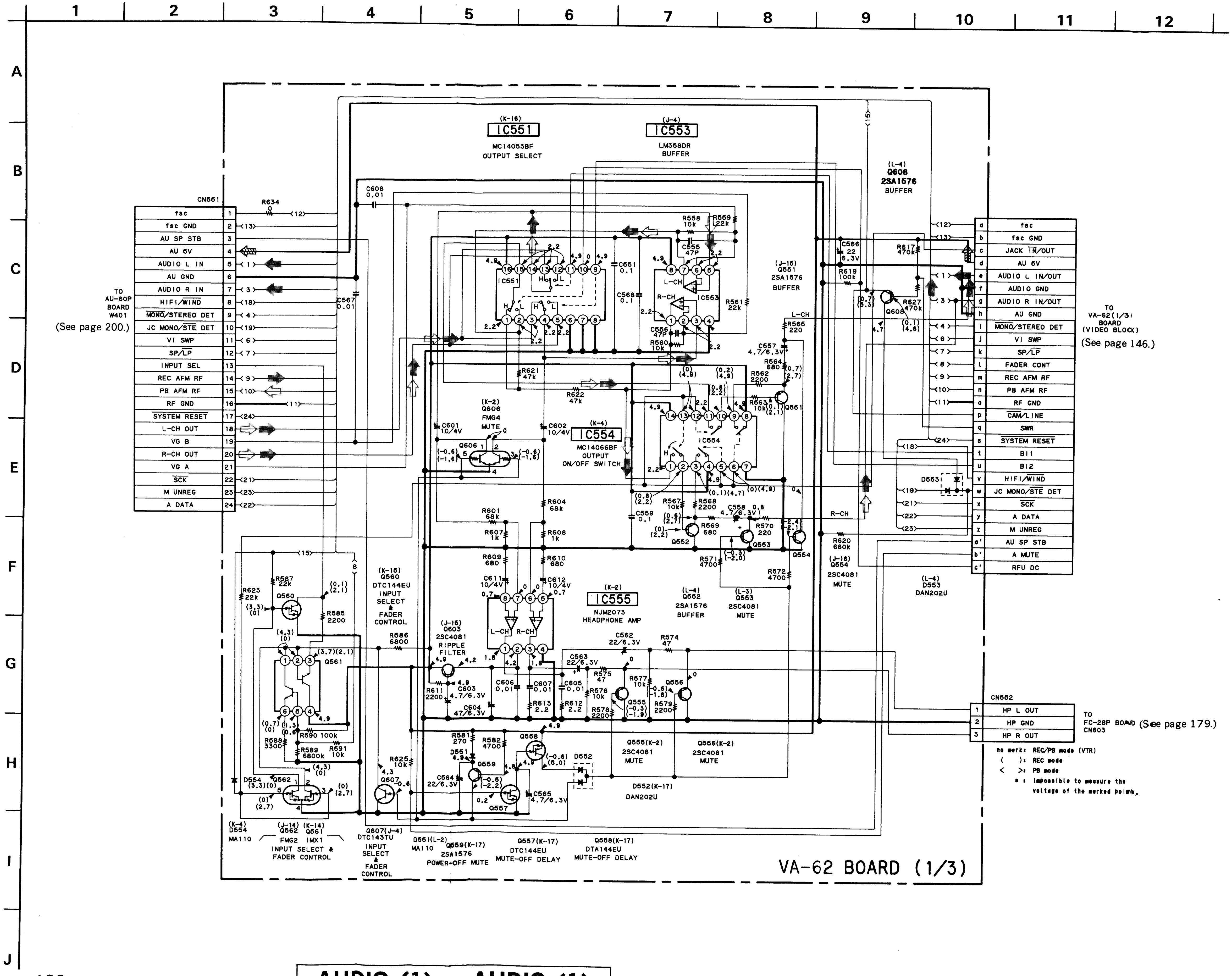
< DIODE >		
D912	8-719-404-46	MA110

< IC >		
IC910	8-759-502-14	CF79050PV
IC911	8-752-010-20	CX20102

< TRANSISTOR >		
Q901	8-729-902-93	FMG4
Q912	8-729-901-01	DTC144EK
Q913	8-729-100-66	2SC1623
Q914	8-729-100-66	2SC1623
Q915	8-729-100-66	2SC1623
Q916	8-729-100-66	2SC1623

VA-62 (Y/CHROMA SIGNAL PROCESS, AUDIO SIGNAL PROCESS) SCHEMATIC DIAGRAM

—Ref. No. VA-62 BOARD : 1000 series—



1
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5
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7
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9
10
11
12
A
B
C
D
E
F
G
H
I
J
CN551
1 fsc
2 fsc GND
3 AU SP STB
4 AU 5V
5 AUDIO L IN
6 AU GND
7 AUDIO R IN
8 HIFI/WIND
9 MONO/STEREO DET
10 JC MONO/STE DET
11 VI SWP
12 SP/LP
13 INPUT SEL
14 REC AFM RF
15 PB AFM RF
16 RF GND
17 SYSTEM RESET
18 L-CH OUT
19 VG B
20 R-CH OUT
21 VG A
22 SCK
23 M UNREG
24 A DATA
TO AU-60P BOARD W401
(See page 200.)
R634 0
C608 0.01
C567 0.01
(K-16) IC551 MC14053BF OUTPUT SELECT
(J-4) IC553 LM358DR BUFFER
(L-4) Q608 2SA1576 BUFFER
R558 10k
R559 22k
C555 47P
C551 0.1
C568 0.1
R561 22k
C556 47P
R560 10k
(J-15) Q551 2SA1576 BUFFER
R565 220
C557 4.7/6.3V
R564 680
R562 2200
R563 10k
R621 47k
R622 47k
(K-2) Q606 FMG4 MUTE
C601 10/4V
C602 10/4V
(K-4) IC554 MC14066BF OUTPUT ON/OFF SWITCH
R567 10k
R568 2200
C558 4.7/6.3V
C559 0.1
R569 680
R570 220
Q552
Q553
Q554
R571 4700
R572 4700
R601 68k
R604 68k
R607 1k
R608 1k
R609 680
R610 680
C611 10/4V
C612 10/4V
(K-2) IC555 NJM2073 HEADPHONE AMP
(L-4) Q552 2SA1576 BUFFER
(L-3) Q553 2SC4081 MUTE
(J-16) Q554 2SC4081 MUTE
R620 680k
R-CH
L-CH
C566 22 6.3V
R619 100k
R617 470k
R627 470k
D553
(L-4) D553 DAN202U
R587 22k
R623 22k
Q560
R585 2200
(K-15) Q560 DTC144EU INPUT SELECT & FADER CONTROL
R586 6800
Q561
(J-16) Q603 2SC4081 RIPPLE FILTER
R611 2200
C603 4.7/6.3V
C604 47/6.3V
C606 0.01
C607 0.01
C605 0.01
R613 2.2
R612 2.2
C562 22/6.3V
R574 47
C563 22/6.3V
R575 47
R576 10k
R577 10k
Q555
Q556
R578 2200
R579 2200
R588 3300
R590 100k
R589 6800k
R591 10k
R625 10k
Q607
R581 270
R582 4700
D551
Q559
Q558
C564 22/6.3V
Q557
C565 4.7/6.3V
D552
D554
Q562
(K-4) D554 MA110
(J-14) Q562 FMG2 (K-14) Q561 IMX1 INPUT SELECT & FADER CONTROL
Q607(J-4) DTC143TU INPUT SELECT & FADER CONTROL
D551(L-2) MA110
Q559(K-17) 2SA1576 POWER-OFF MUTE
Q557(K-17) DTC144EU MUTE-OFF DELAY
Q558(K-17) DTA144EU MUTE-OFF DELAY
Q555(K-2) 2SC4081 MUTE
Q556(K-2) 2SC4081 MUTE
D552(K-17) DAN202U
a fsc
b fsc GND
c JACK IN/OUT
d AU 5V
e AUDIO L IN/OUT
f AUDIO GND
g AUDIO R IN/OUT
h AU GND
i MONO/STEREO DET
j VI SWP
k SP/LP
l FADER CONT
m REC AFM RF
n PB AFM RF
o RF GND
p CAM/LINE
q SWR
s SYSTEM RESET
t BI1
u BI2
v HIFI/WIND
w JC MONO/STE DET
x SCK
y A DATA
z M UNREG
a' AU SP STB
b' A MUTE
c' RFU DC
TO VA-62(1/3) BOARD (VIDEO BLOCK)
(See page 146.)
CN552
1 HP L OUT
2 HP GND
3 HP R OUT
TO FC-28P BOARD CN603 (See page 179.)
No mark: REC/PB mode (VTR)
( ): REC mode
< >: PB mode
*: Impossible to measure the voltage of the marked points.
VA-62 BOARD (1/3)

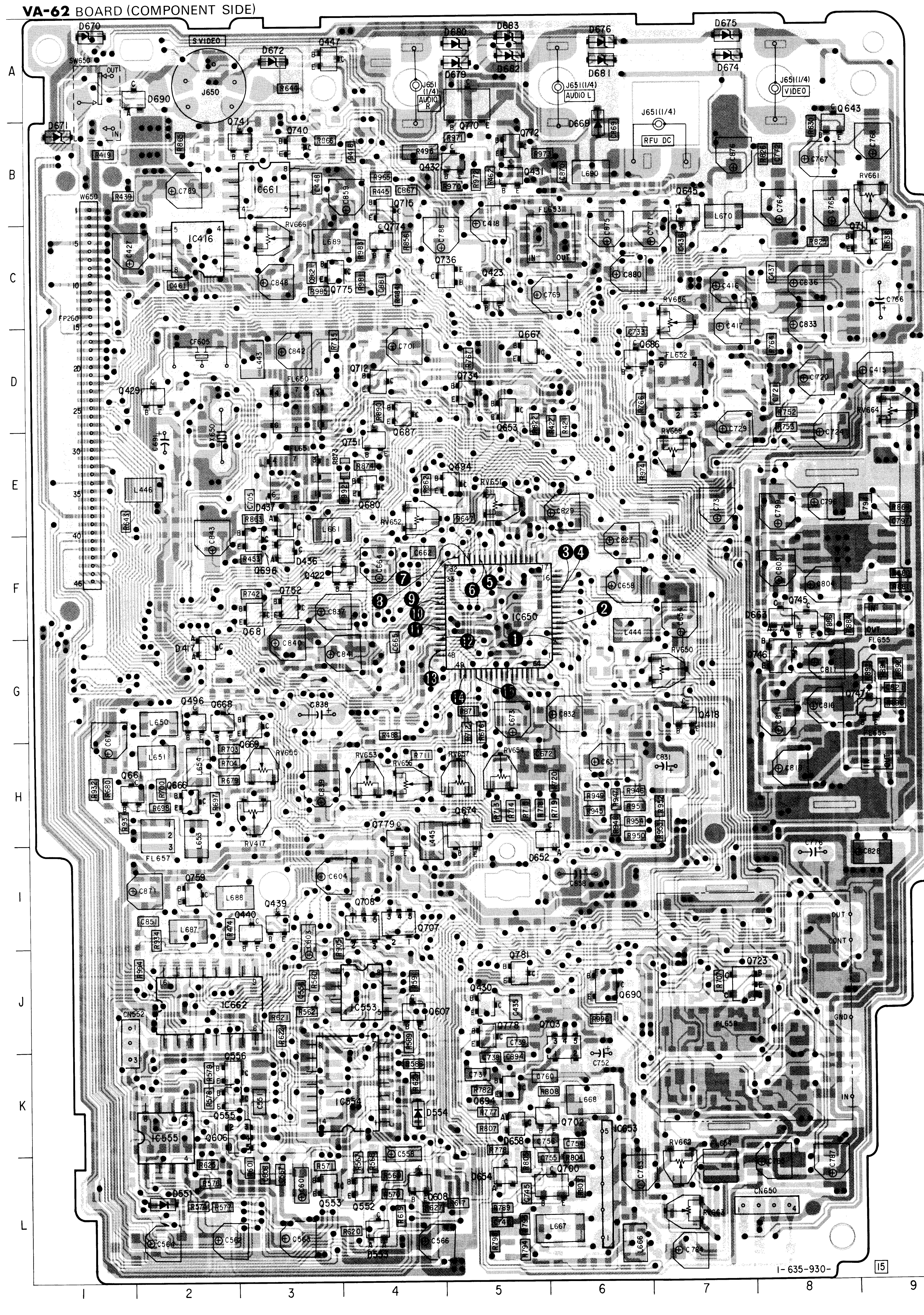
• **Signal path**

	AUDIO Signal
REC	➡
PB	⇨

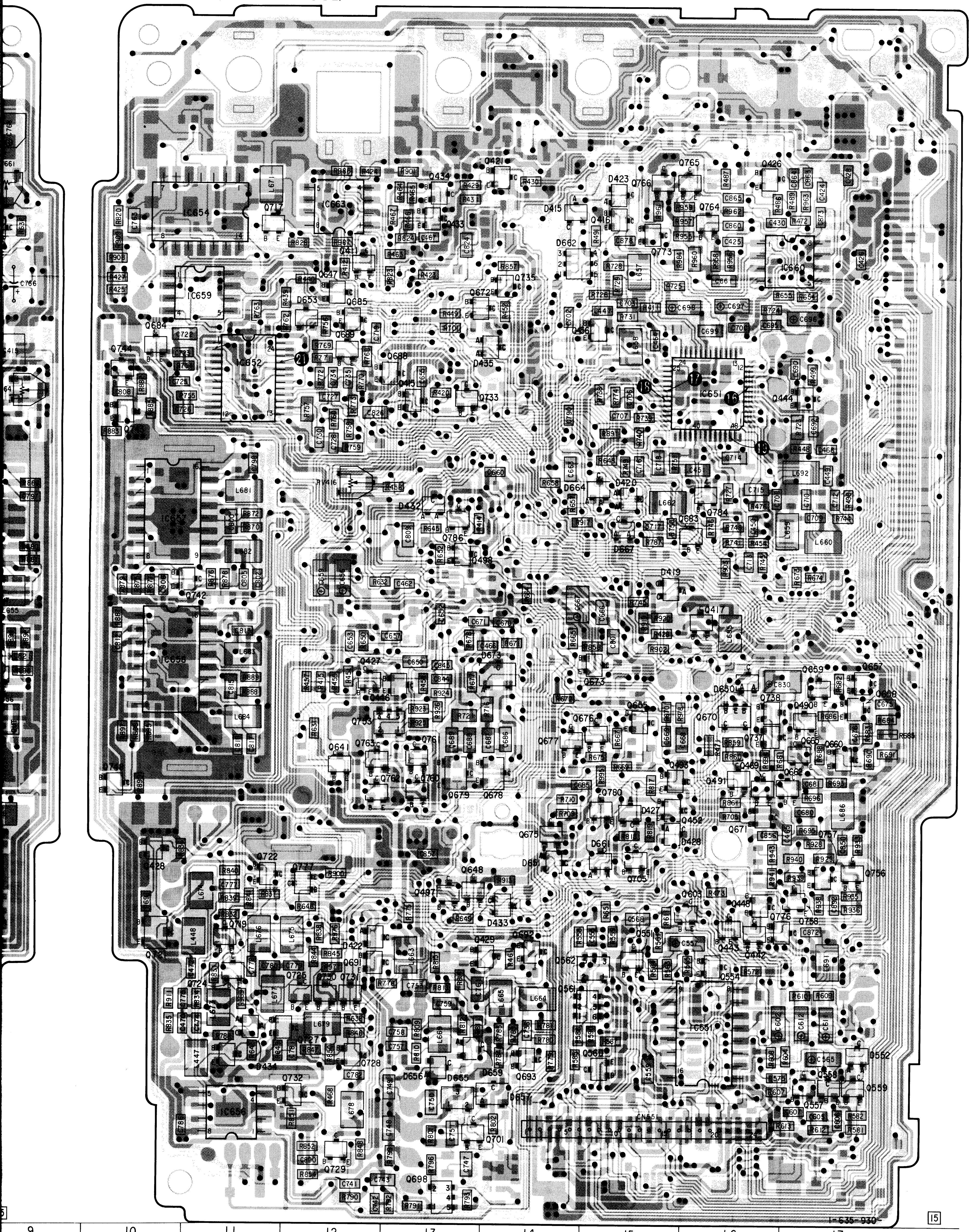
VA-62 (Y/CHROMA SIGNAL PROCESS, AUDIO SIGNAL PROCESS) PRINTED WIRING BOARD

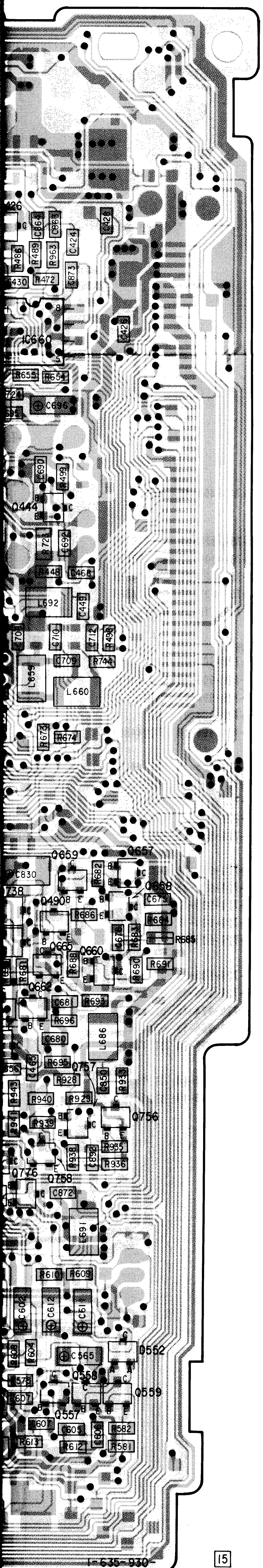
—Ref. No. VA-62 BOARD : 1000 series—

VA-62 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
H
I
J
K
L
1
2
3
4
5
6
7
8
9
S VIDEO
J650
J651(1/4) AUDIO R
J651(1/4) AUDIO L
J651(1/4) RFU DC
J651(1/4) VIDEO
W650
FP260
IC650
IC661
IC416
IC662
IC553
IC554
IC555
IC653
CN552
CN650
1-635-930-
15

VA-62 BOARD (CONDUCTOR SIDE)


IC654
IC653
IC659
IC652
IC651
IC660
IC657
IC658
IC655
IC551
CN551
RV416
L681
L684
L660
L662
L664
L686
1-635-930-
15
9
10
11
12
13
14
15
16
17



< DIODE >

D415	8-719-421-30	MA141A
D417	8-719-941-86	DAN202U
D419	8-719-941-09	DAP202U
D420	8-719-941-86	DAN202U
D422	8-719-941-86	DAN202U
D423	8-719-941-86	DAN202U
D427	8-719-941-86	DAN202U
D428	8-719-941-86	DAN202U
D432	8-719-941-86	DAN202U
D433	8-719-941-09	DAP202U
D434	8-719-941-09	DAP202U
D435	8-719-941-86	DAN202U
D436	8-719-941-86	DAN202U
D437	8-719-941-86	DAN202U
D551	8-719-404-46	MA110
D552	8-719-941-86	DAN202U
D553	8-719-941-86	DAN202U
D554	8-719-404-46	MA110
D650	8-719-941-86	DAN202U
D651	8-719-941-86	DAN202U
D652	8-719-941-86	DAN202U
D653	8-719-941-86	DAN202U
D654	8-719-941-86	DAN202U
D655	8-719-800-76	1SS226
D656	8-719-941-86	DAN202U
D657	8-719-800-76	1SS226
D658	8-719-941-86	DAN202U
D659	8-719-941-86	DAN202U
D661	8-719-941-86	DAN202U
D662	8-719-951-22	IMN10
D663	8-719-941-86	DAN202U
D664	8-719-941-86	DAN202U
D667	8-719-941-86	DAN202U
D669	8-719-977-22	DTZ9. 1
D670	8-719-977-22	DTZ9. 1
D671	8-719-977-22	DTZ9. 1
D672	8-719-977-22	DTZ9. 1
D673	8-719-800-76	1SS226
D674	8-719-977-22	DTZ9. 1
D675	8-719-977-22	DTZ9. 1
D676	8-719-977-22	DTZ9. 1
D679	8-719-977-22	DTZ9. 1
D680	8-719-977-22	DTZ9. 1
D681	8-719-977-22	DTZ9. 1
D682	8-719-977-22	DTZ9. 1
D683	8-719-977-22	DTZ9. 1
D690	8-719-941-86	DAN202U

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IC553	8-759-998-98	LM358D
IC554	8-759-008-67	MC14066BF
IC555	8-759-701-02	NJM2073M
IC650	8-752-036-19	CXA1207R
IC651	8-752-036-20	CXA1208R
IC652	8-759-605-61	CXA1203N
IC653	8-759-925-60	BA401
IC654	8-752-009-51	CX20095A
IC656	8-759-320-76	HA118070FP
IC657	8-752-333-24	CXL1506M
IC658	8-752-333-24	CXL1506M
IC659	8-759-710-29	NJM2235M
IC660	8-759-710-07	NJM2234M
IC661	8-759-710-07	NJM2234M
IC662	8-759-009-22	MC14094BF
IC663	8-759-710-29	NJM2235M

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Q415	8-729-905-23	2SA1576-R
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Q417	8-729-905-12	DTA144EU
Q418	8-729-905-35	2SC4081-R
Q421	8-729-905-23	2SA1576-R
Q422	8-729-905-18	DTC144EU
Q423	8-729-905-35	2SC4081-R
Q426	8-729-905-35	2SC4081-R
Q427	8-729-905-35	2SC4081-R
Q428	8-729-905-XX	DTC114TU
Q429	8-729-905-35	2SC4081-R
Q430	8-729-905-18	DTC144EU
Q431	8-729-905-23	2SA1576-R
Q432	8-729-905-23	2SA1576-R
Q433	8-729-905-35	2SC4081-R
Q434	8-729-905-23	2SA1576-R
Q439	8-729-905-12	DTA144EU
Q440	8-729-905-35	2SC4081-R
Q442	8-729-905-18	DTC144EU
Q443	8-729-905-18	DTC144EU
Q444	8-729-905-35	2SC4081-R
Q446	8-729-905-35	2SC4081-R
Q447	8-729-905-12	DTA144EU
Q448	8-729-905-18	DTC144EU
Q452	8-729-905-18	DTC144EU
Q456	8-729-905-18	DTC144EU
Q469	8-729-905-18	DTC144EU
Q490	8-729-905-35	2SC4081-R
Q491	8-729-905-12	DTA144EU
Q493	8-729-905-12	DTA144EU
Q494	8-729-905-35	2SC4081-R
Q496	8-729-905-35	2SC4081-R
Q497	8-729-905-18	DTC144EU
Q498	8-729-905-18	DTC144EU
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Q552	8-729-905-23	2SA1576-R
Q553	8-729-905-35	2SC4081-R
Q554	8-729-905-35	2SC4081-R
Q555	8-729-905-35	2SC4081-R
Q556	8-729-905-35	2SC4081-R
Q557	8-729-905-18	DTC144EU
Q558	8-729-905-12	DTA144EU
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Q560	8-729-905-18	DTC144EU
Q561	8-729-907-26	IMX1
Q562	8-729-904-07	FMG2
Q603	8-729-905-35	2SC4081-R
Q606	8-729-902-93	FMG4
Q607	8-729-922-94	DTC143TU
Q608	8-729-905-23	2SA1576-R
Q643	8-729-905-23	2SA1576-R
Q645	8-729-905-18	DTC144EU
Q647	8-729-905-18	DTC144EU
Q648	8-729-905-12	DTA144EU
Q649	8-729-905-18	DTC144EU
Q653	8-729-905-18	DTC144EU
Q655	8-729-905-12	DTA144EU
Q657	8-729-905-35	2SC4081-R
Q658	8-729-905-35	2SC4081-R
Q659	8-729-905-35	2SC4081-R
Q660	8-729-905-35	2SC4081-R
Q661	8-729-905-12	DTA144EU
Q662	8-729-905-96	DTA114TU
Q665	8-729-905-45	DTA143EU
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Q670	8-729-903-10	FMW1
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Q676	8-729-905-12	DTA144EU
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Q683	8-729-905-23	2SA1576-R
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Q688	8-729-905-35	2SC4081-R
Q689	8-729-905-35	2SC4081-R
Q690	8-729-141-48	2SB624-BV345
Q691	8-729-905-18	DTC144EU
Q692	8-729-905-18	DTC144EU
Q693	8-729-905-35	2SC4081-R
Q694	8-729-905-35	2SC4081-R
Q696	8-729-905-18	DTC144EU
Q698	8-729-903-10	FMW1
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Q701	8-729-905-35	2SC4081-R
Q702	8-729-905-35	2SC4081-R
Q703	8-729-903-10	FMW1
Q705	8-729-905-12	DTA144EU
Q707	8-729-904-20	FMA2
Q708	8-729-904-07	FMG2
Q711	8-729-905-12	DTA144EU
Q712	8-729-905-12	DTA144EU
Q717	8-729-905-23	2SA1576-R
Q719	8-729-905-18	DTC144EU
Q721	8-729-202-38	2SC3326N
Q722	8-729-905-35	2SC4081-R
Q723	8-729-904-07	FMG2
Q724	8-729-905-23	2SA1576-R
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Q729	8-729-905-35	2SC4081-R
Q730	8-729-905-23	2SA1576-R
Q731	8-729-905-12	DTA144EU
Q732	8-729-905-35	2SC4081-R
Q733	8-729-905-18	DTC144EU
Q734	8-729-905-18	DTC144EU
Q735	8-729-905-35	2SC4081-R
Q736	8-729-905-45	DTA143EU
Q737	8-729-905-35	2SC4081-R
Q738	8-729-905-35	2SC4081-R
Q742	8-729-905-23	2SA1576-R
Q743	8-729-905-35	2SC4081-R
Q744	8-729-905-35	2SC4081-R
Q745	8-729-905-18	DTC144EU
Q746	8-729-141-48	2SB624-BV345
Q747	8-729-905-23	2SA1576-R
Q748	8-729-905-35	2SC4081-R
Q751	8-729-905-35	2SC4081-R
Q752	8-729-905-23	2SA1576-R
Q753	8-729-904-20	FMA2
Q756	8-729-905-18	DTC144EU
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Q758	8-729-905-23	2SA1576-R
Q759	8-729-905-35	2SC4081-R
Q760	8-729-905-12	DTA144EU
Q761	8-729-905-18	DTC144EU
Q762	8-729-905-18	DTC144EU
Q763	8-729-905-18	DTC144EU
Q764	8-729-905-35	2SC4081-R
Q765	8-729-905-35	2SC4081-R
Q766	8-729-905-23	2SA1576-R
Q770	8-729-101-07	2SB798-L
Q772	8-729-905-12	DTA144EU
Q773	8-729-905-12	DTA144EU
Q774	8-729-905-35	2SC4081-R
Q775	8-729-905-18	DTC144EU
Q776	8-729-905-12	DTA144EU
Q777	8-729-905-23	2SA1576-R
Q778	8-729-905-57	DTA124EU
Q779	8-729-905-18	DTC144EU
Q780	8-729-905-18	DTC144EU
Q781	8-729-905-18	DTC144EU
Q784	8-729-905-35	2SC4081-R
Q786	8-729-905-18	DTC144EU

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IC402	8-759-009-22	MC14094BF
IC403	8-759-823-20	CXA-1488R
IC404	8-759-823-20	CXA-1488R
IC405	8-759-710-79	NJM2107F
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Q402	8-729-905-18	DTC144EU
Q403	8-729-904-07	FMG2
Q404	8-729-904-07	FMG2
Q405	8-729-905-18	DTC144EU
Q407	8-729-905-18	DTC144EU
Q408	8-729-907-26	IMX1
Q409	8-729-905-35	2SC4081-R
Q410	8-729-907-26	IMX1
Q411	8-729-907-26	IMX1
Q412	8-729-905-18	DTC144EU
Q413	8-729-905-35	2SC4081-R
Q414	8-729-905-12	DTA144EU
Q415	8-729-905-18	DTC144EU
Q416	8-729-905-12	DTA144EU
Q417	8-729-905-18	DTC144EU
Q418	8-729-905-18	DTC144EU
Q420	8-729-924-46	DTC124XU
Q421	8-729-905-12	DTA144EU
Q422	8-729-922-94	DTC143TU
Q423	8-729-922-94	DTC143TU
Q424	8-729-905-18	DTC144EU

AU-6
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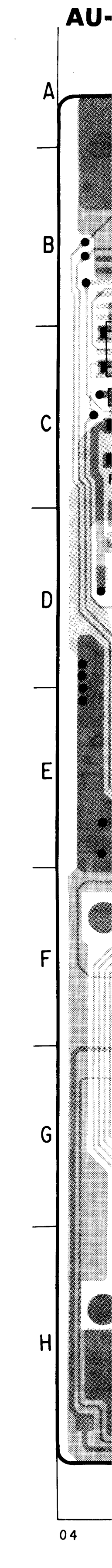
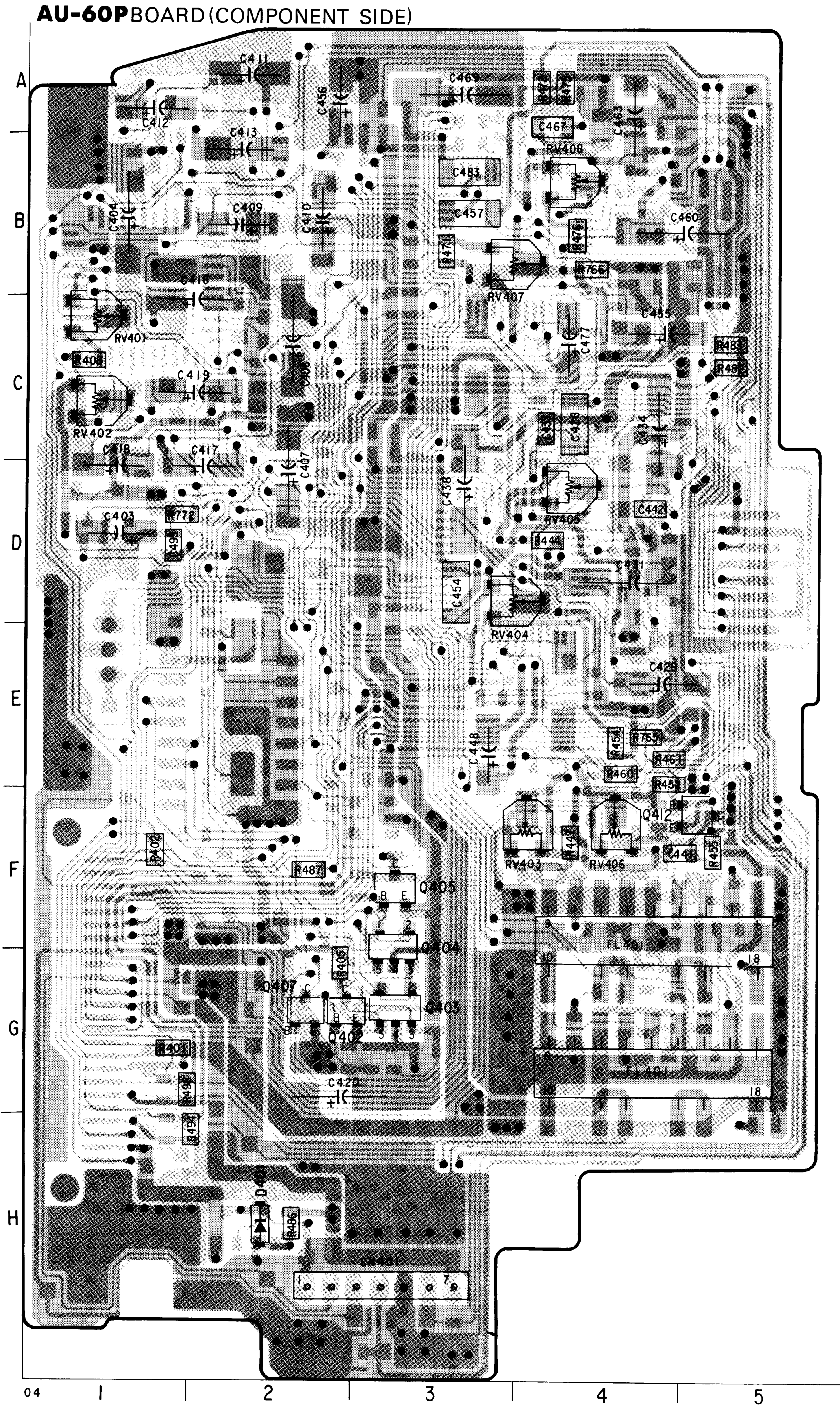


AU-60P (ATF/AFM PROCESS), MC-43P (MIC AMP), MJ-40P (HEADPHONE/MIC PLUG IN POWER JACK) PRINTED WIRING BOARD

—Ref. No. AU-60P, MC-43P, MJ-40P BOARDS : 6000 series—

AU-60P BOARD (COMPONENT SIDE)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B
C
D
E
F
G
H
04
1
2
3
4
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C411
C412
C413
C456
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C463
RV408
C483
C457
C460
C409
C404
C410
RV407
C416
RV401
C455
C477
R408
C419
C406
R483
R482
RV402
C418
C417
C407
C438
C434
C428
RV405
C442
C403
R772
R493
R444
C431
C454
RV404
C429
C448
R454
R765
R461
R460
R453
Q412
RV403
RV406
R402
R487
Q405
Q404
R405
Q407
Q403
Q402
R401
C420
D401
R486
CN401
FL401
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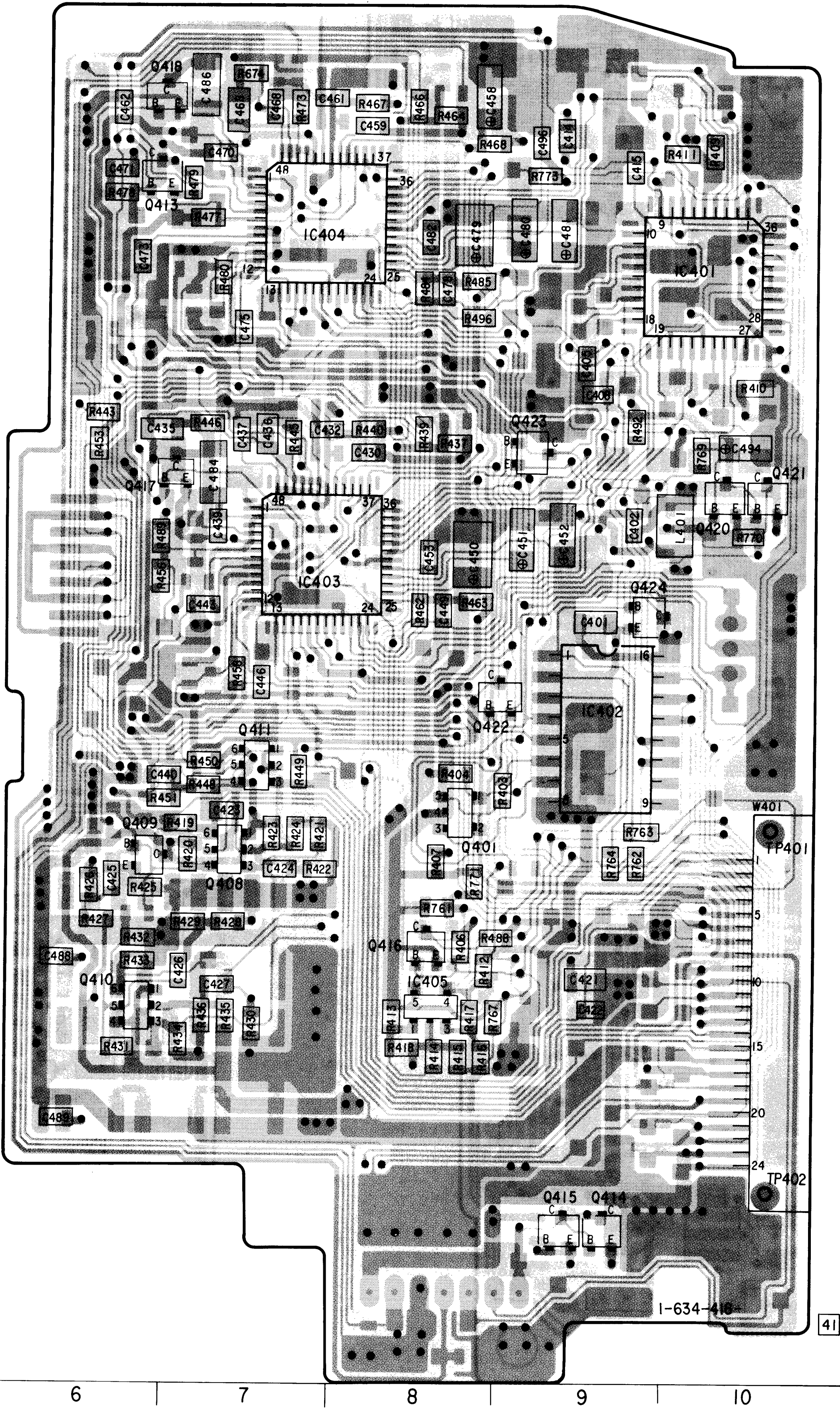
10
18

AU-60P BOARD (CONDUCTOR SIDE)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R468
C496
R775
C471
Q413
C470
R479
IC404
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12
13
24
25
R481
C479
C484
C481
R485
R496
IC401
R411
R409
C415
R410
R443
R453
C435
R445
C437
C436
R448
C432
R440
C430
R439
R437
Q423
R492
R769
C494
Q421
Q417
C484
IC403
C453
C450
C451
C452
C402
L401
Q420
R770
R462
C449
R463
Q424
C401
IC402
16
R456
C446
Q411
Q422
C440
R450
R451
R446
R449
R406
R403
Q409
R419
R423
R424
R421
Q401
R763
R764
R762
W401
TP401
R425
R422
C424
Q408
R420
R427
R429
R428
R761
C488
R433
C426
C427
Q410
R436
R435
R430
Q416
R408
R412
R488
C421
C422
IC405
R413
R417
R767
R431
R434
R418
R414
R415
R416
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Q414
TP402
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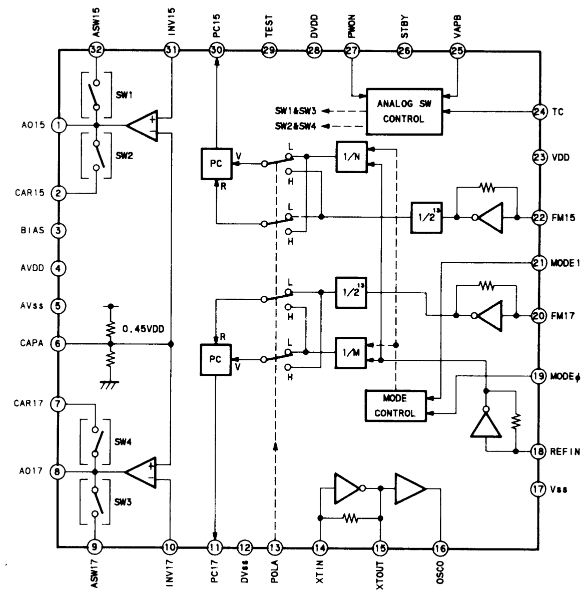
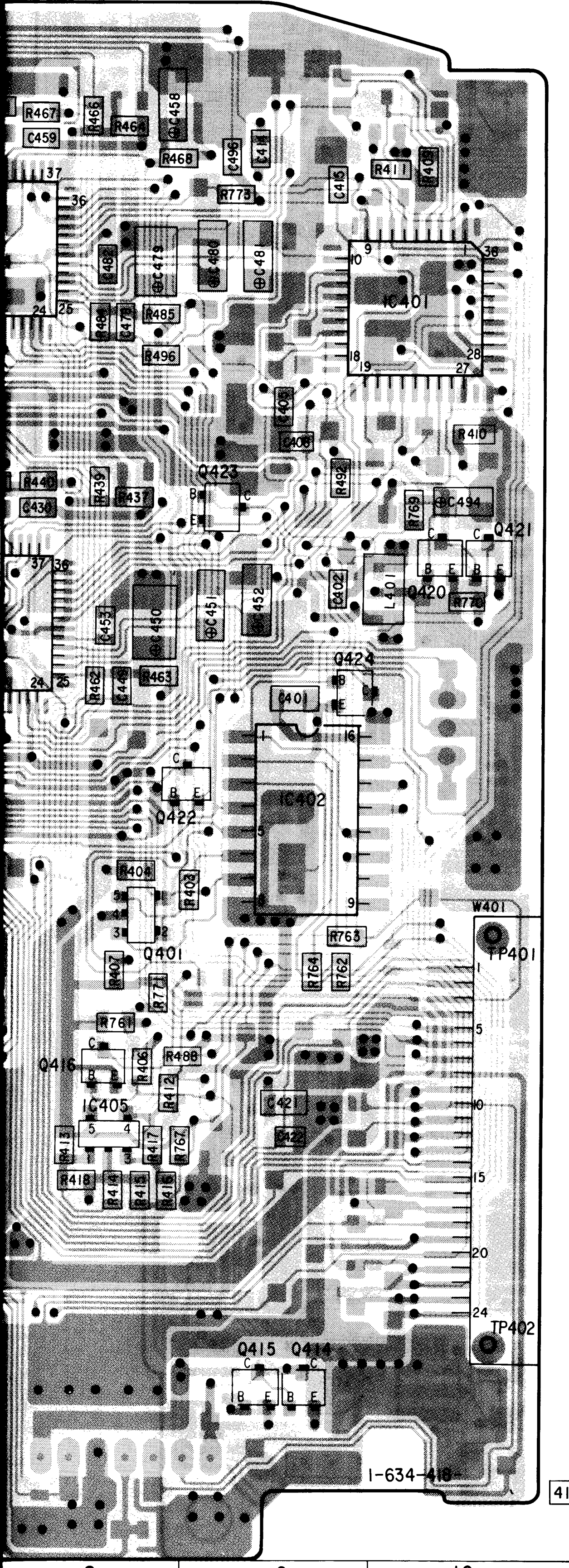
24

AU-60P BOARD IC401 CXD2106Q


ASW15
INV15
PC15
TEST
DVDD
PWON
STBY
VAPB
32
31
30
29
28
27
26
25
ANALOG SW CONTROL
SW1&SW3
SW2&SW4
24 TC
23 VDD
22 FM15
21 MODE1
20 FM17
19 MODEϕ
18 REFIN
17 Vss
AO15 1
CAR15 2
BIAS 3
AVDD 4
AVss 5
CAPA 6
CAR17 7
AO17 8
SW1
SW2
SW3
SW4
0.45VDD
PC
V
R
L
H
1/N
1/M
1/2^13
MODE CONTROL
9
10
11
12
13
14
15
16
ASW17
INV17
PC17
DVss
POLA
XTIN
XTOUT
OSCO

RD

(TOR SIDE)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R466
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C458
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C496
C414
R778
C415
R411
R409
37
36
R482
C473
R486
C481
IC401
36
10
25
24
R489
C479
R485
R496
18
19
27
28
C408
C406
R410
R440
C430
R439
R437
Q423
R492
R769
C494
Q421
37
36
R457
C440
C451
C452
C402
L401
Q420
R770
R462
C441
R463
Q424
C401
IC402
16
Q422
R404
R403
R763
W401
TP401
Q401
R407
R772
R764
R762
R761
Q416
R406
R488
R412
IC405
C421
C422
R413
R418
R414
R417
R767
R415
5
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15
20
24
TP402
Q415
Q414
1-634-418-
41
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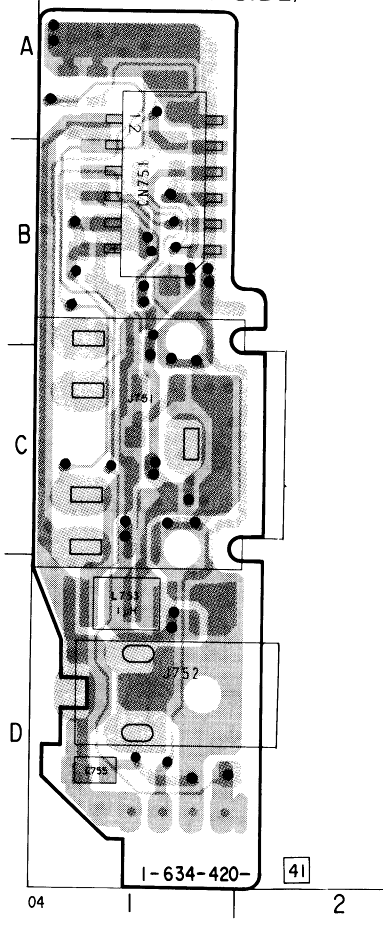
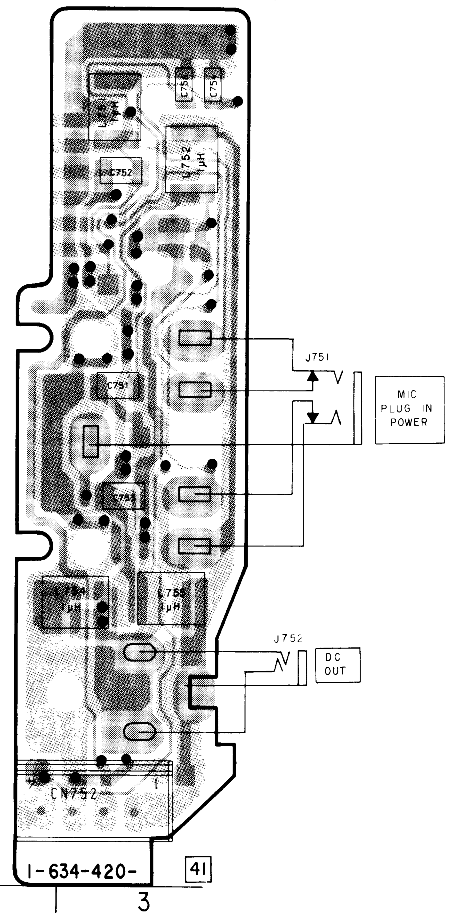
9
10

MJ-40P BOARD
(COMPONENT SIDE)


A
B
C
D
CN751
J751
L753
J752
C755
1-634-420-
41
04
1
2

MJ-40P BOARD
(CONDUCTOR SIDE)


C754
L751
C753
L752
C752
C751
J751
MIC PLUG IN POWER
C753
L754
L755
J752
DC OUT
CN752
1-634-420-
41
3

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IC801	8-759-111-56	uPC4572G2
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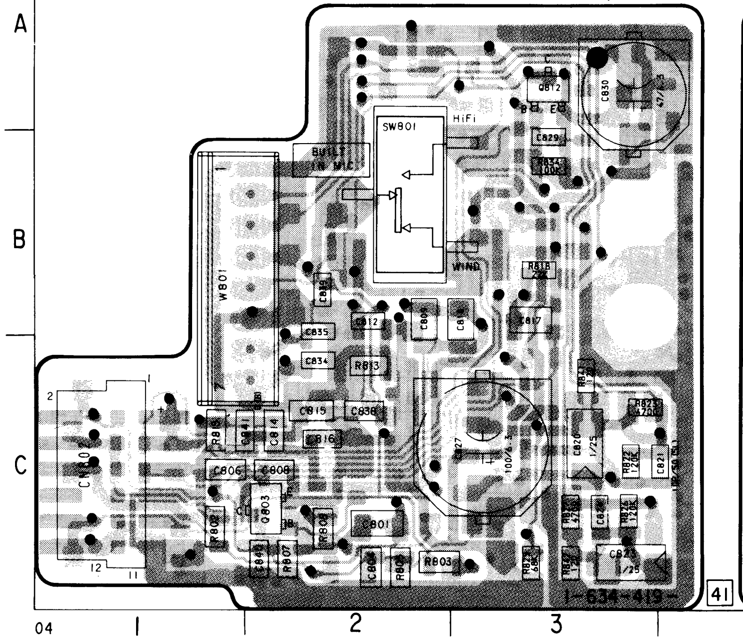
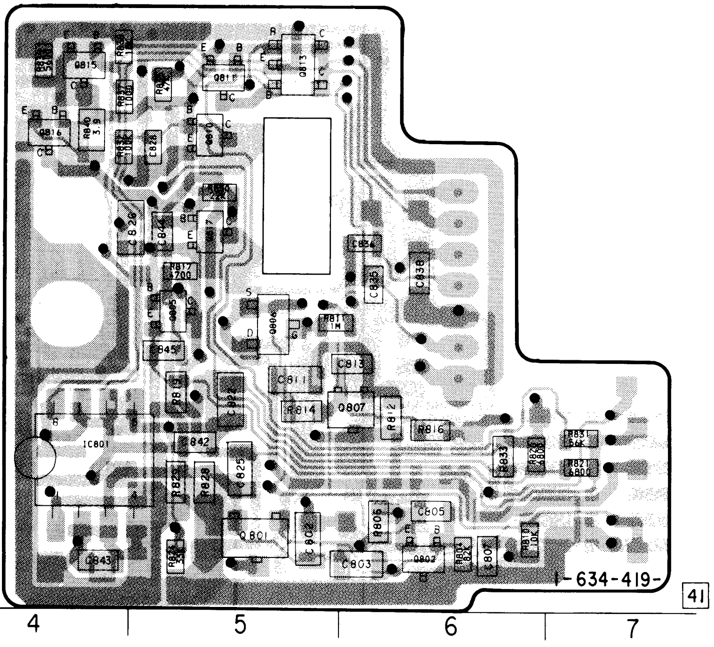
Q802	8-729-905-35	2SC4081-R
Q803	8-729-905-12	DTA144EU
Q805	8-729-905-35	2SC4081-R
Q806	8-729-109-44	2SK94
Q807	8-729-905-35	2SC4081-R
Q808	8-729-905-12	DTA144EU
Q810	8-729-905-35	2SC4081-R
Q811	8-729-905-12	DTA144EU
Q812	8-729-905-35	2SC4081-R
Q813	8-729-904-07	FMG2
Q815	8-729-905-35	2SC4081-R
Q816	8-729-905-23	2SA1576-R
Q817	8-729-905-35	2SC4081-R

MC-43P BOARD
(COMPONENT SIDE)


A
B
C
SW901
HiFi
BUILT IN MIC
WIND
W801
C830
C812
C829
R818
C817
C835
C834
R813
C815
C836
C816
C814
C806
C808
C803
Q803
Q802
R802
C801
R803
R801
1-634-419-
41
04
1
2
3

MC-43P BOARD
(CONDUCTOR SIDE)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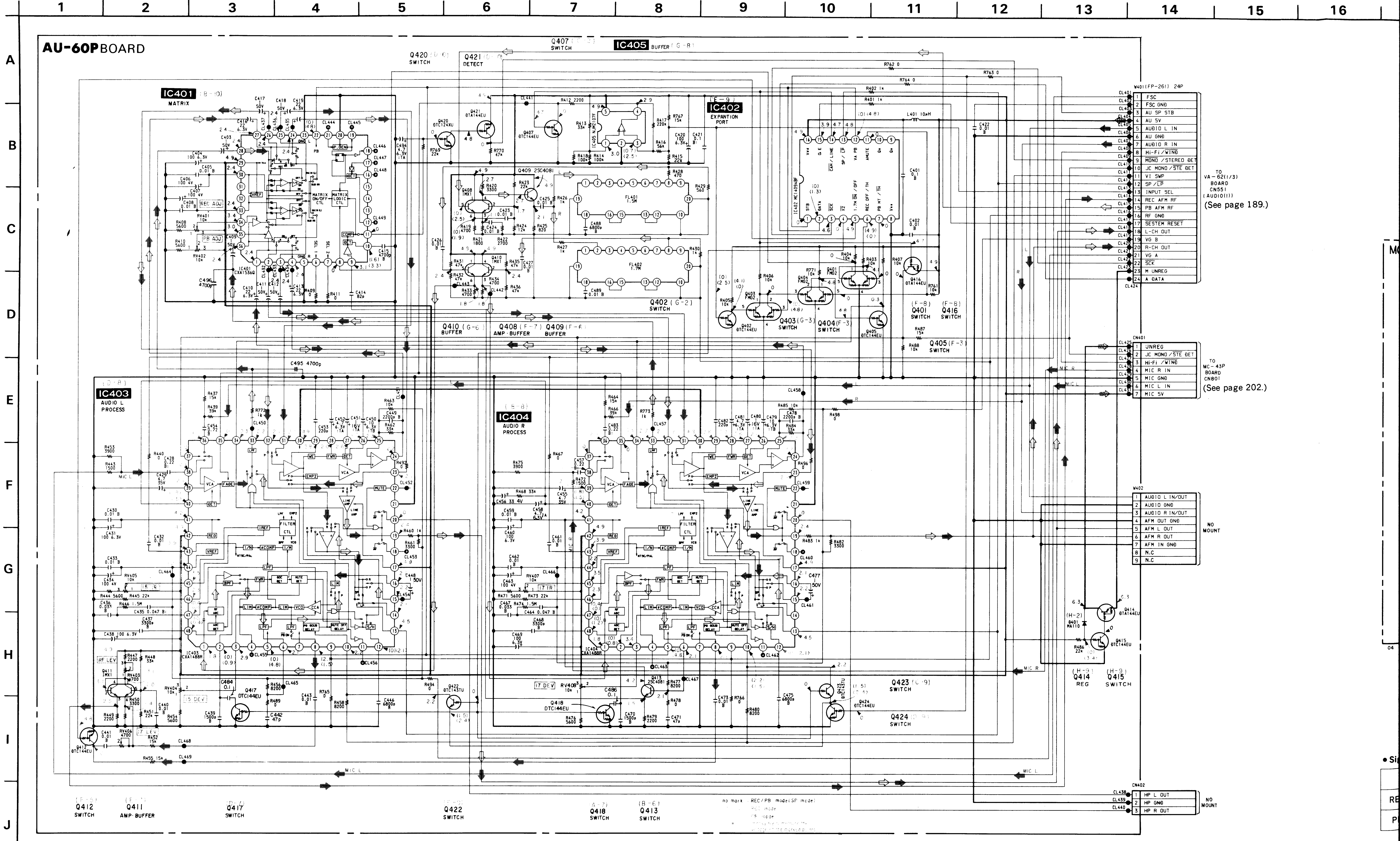
Q815
Q813
Q817
Q816
Q812
C836
C838
Q806
C845
R814
Q811
R816
IC801
Q807
Q801
Q805
C805
C803
C843
1-634-419-
41
4
5
6
7

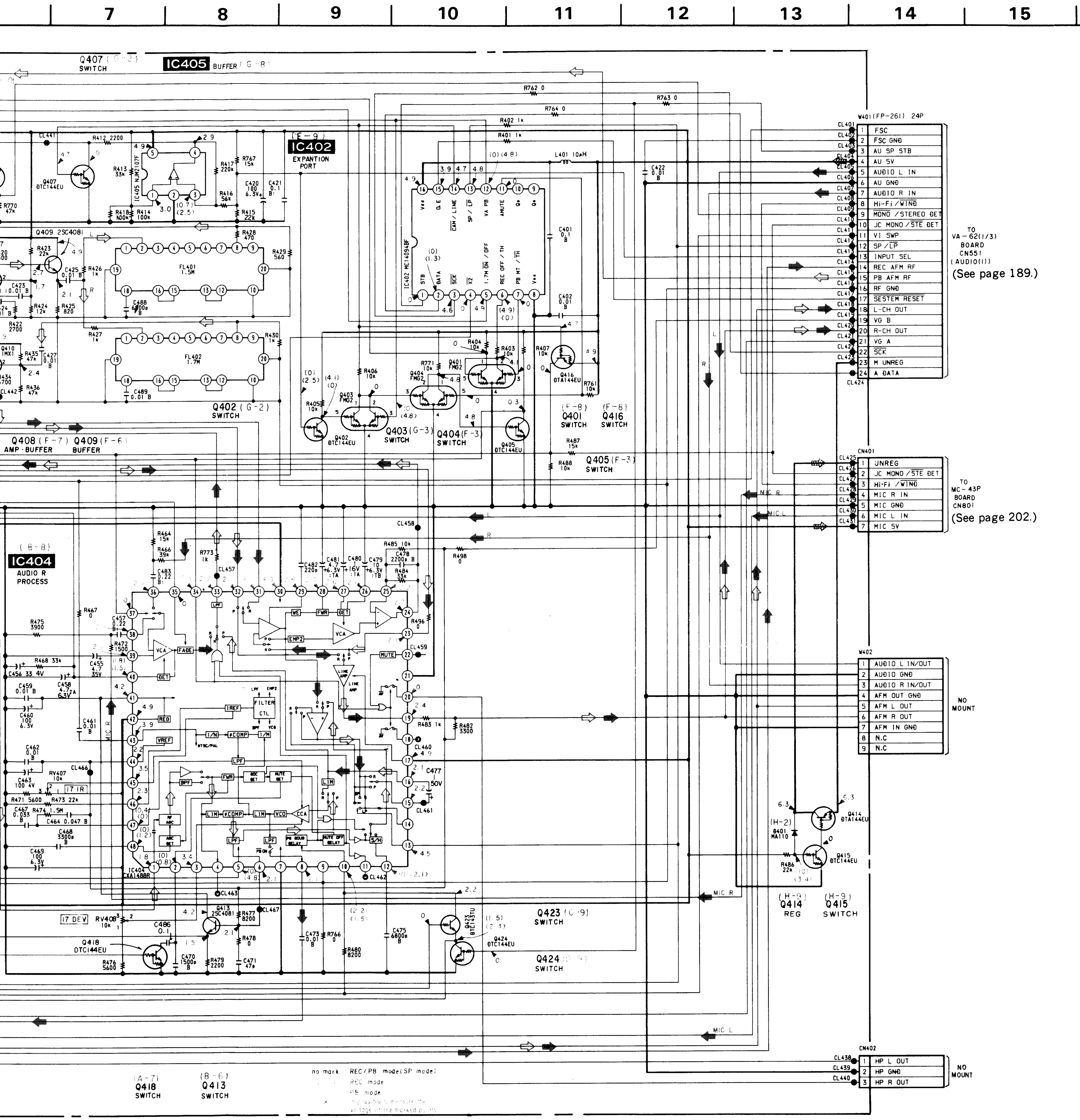
AU-60P (ATF/AFM PROCESS), MC-43P (MIC AMP), MJ-40P (HEADPHONE/MIC PLUG IN POWER JACK) SCHEMATIC DIAGRAM

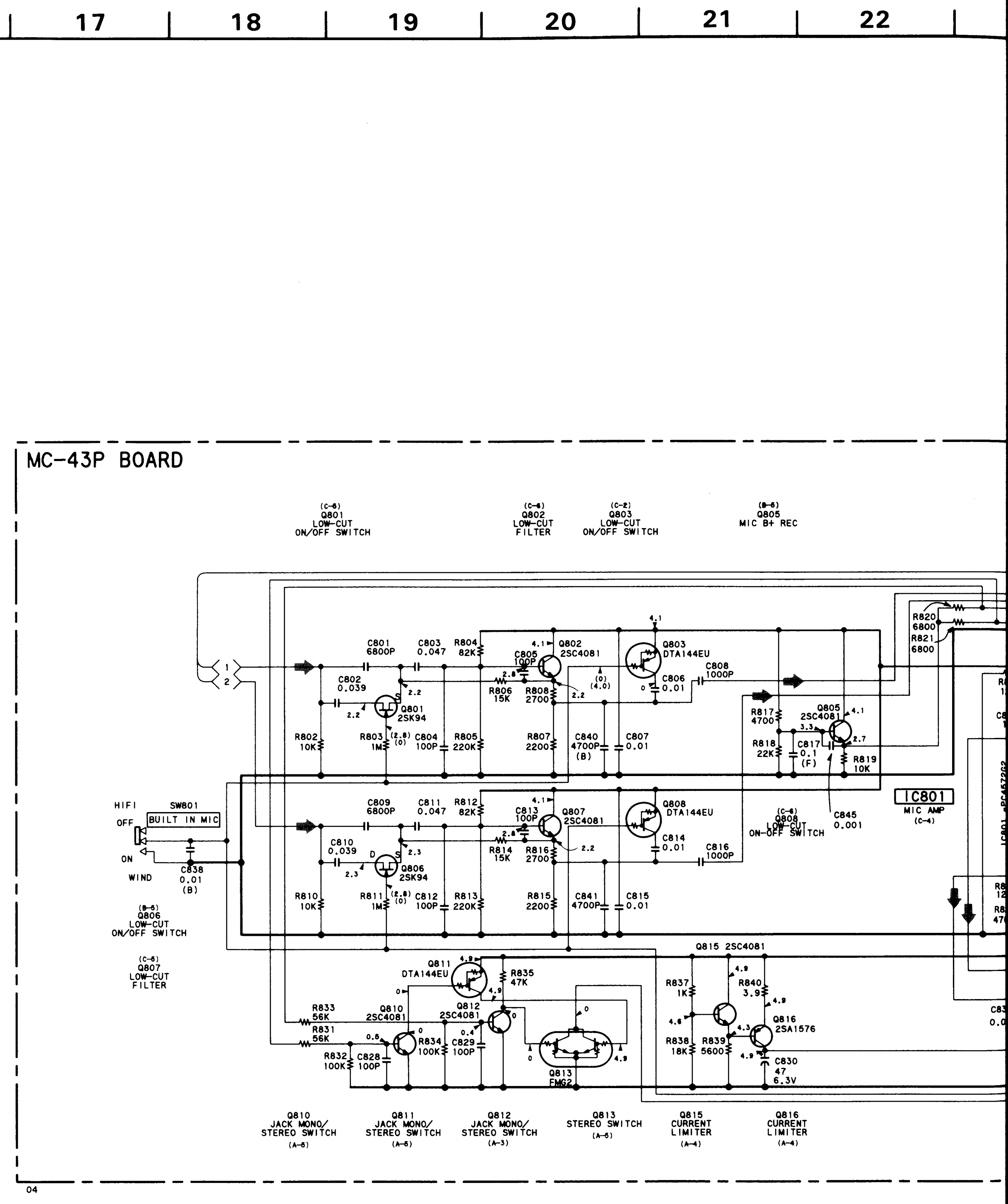
—Ref. No. AU-60P, MC-43P, MJ-40P BOARDS : 6000 series—



AU-60P BOARD
IC401 MATRIX
IC401 CXA1536Q
IC402 EXPANTION PORT
IC402 MC14094BF
IC403 AUDIO L PROCESS
IC403 CXA1488R
IC404 AUDIO R PROCESS
IC404 CXA1488R
IC405 BUFFER
Q401 SWITCH
Q402 SWITCH
Q403 SWITCH
Q404 SWITCH
Q405 SWITCH
Q407 SWITCH
Q408 AMP·BUFFER
Q409 BUFFER
Q410 BUFFER
Q411 AMP·BUFFER
Q412 SWITCH
Q413 SWITCH
Q414 REG
Q415 SWITCH
Q416 SWITCH
Q417 SWITCH
Q418 SWITCH
Q420 SWITCH
Q421 DETECT
Q422 SWITCH
Q423 SWITCH
Q424 SWITCH
FL401 1.5M
FL402 1.7M
L401 10µH
W401 (FP-261) 24P
1 FSC
2 FSC GND
3 AU SP STB
4 AU 5V
5 AUDIO L IN
6 AU GND
7 AUDIO R IN
8 Hi-Fi/WIND
9 MONO/STEREO DET
10 JC MONO/STE DET
11 VI SWP
12 SP/LP
13 INPUT SEL
14 REC AFM RF
15 PB AFM RF
16 RF GND
17 SESTEM RESET
18 L-CH OUT
19 VG B
20 R-CH OUT
21 VG A
22 SCK
23 M UNREG
24 A DATA
TO VA-62(1/3) BOARD CN551 (AUDIO(1))
(See page 189.)
CN401
1 UNREG
2 JC MONO/STE DET
3 Hi-Fi/WIND
4 MIC R IN
5 MIC GND
6 MIC L IN
7 MIC 5V
TO MC-43P BOARD CN801
(See page 202.)
W402
1 AUDIO L IN/OUT
2 AUDIO GND
3 AUDIO R IN/OUT
4 AFM OUT GND
5 AFM L OUT
6 AFM R OUT
7 AFM IN GND
8 N.C
9 N.C
NO MOUNT
CN402
1 HP L OUT
2 HP GND
3 HP R OUT
NO MOUNT
no mark : REC/PB mode(SP mode)
MIC L
MIC R

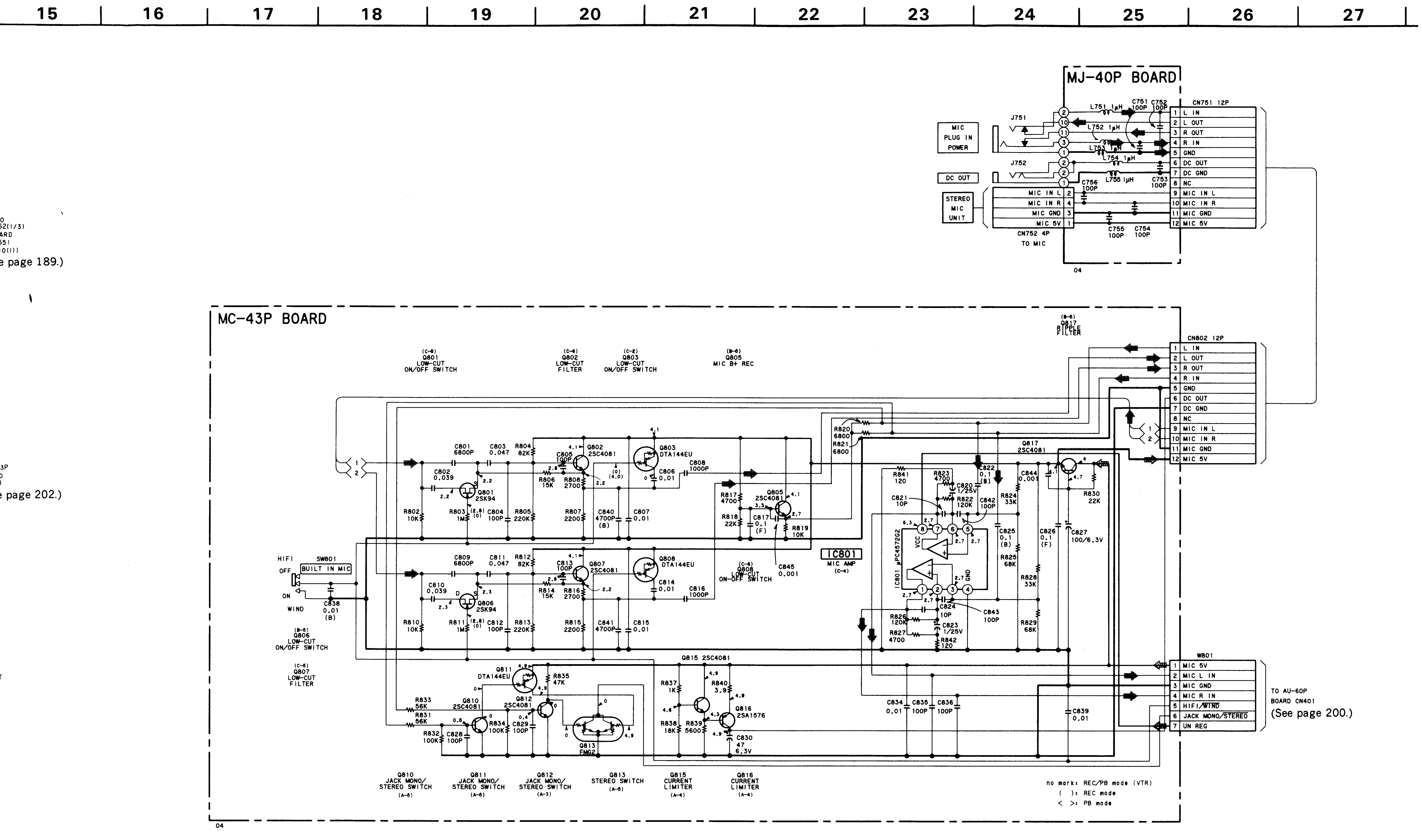
N POWER JACK) SCHEMATIC DIAGRAM


7
8
9
10
11
12
13
14
15
Q407 SWITCH
IC405 BUFFER (G-8)
IC402 EXPANTION PORT
IC404 AUDIO R PROCESS
FL401 1.5M
FL402 1.7M
Q402 (G-2) SWITCH
Q408 (F-7) AMP·BUFFER
Q409 (F-6) BUFFER
Q403 (G-3) SWITCH
Q404 (F-3) SWITCH
Q401 SWITCH
Q416 SWITCH
Q405 (F-3) SWITCH
Q414 REG
Q415 SWITCH
Q423 (C-9) SWITCH
Q424 SWITCH
Q418 SWITCH
Q413 SWITCH
W401 (FP-261) 24P
1 FSC
2 FSC GND
3 AU SP STB
4 AU 5V
5 AUDIO L IN
6 AU GND
7 AUDIO R IN
8 Hi-Fi / WIND
9 MONO / STEREO DET
10 JC MONO / STE DET
11 VI SWP
12 SP / LP
13 INPUT SEL
14 REC AFM RF
15 PB AFM RF
16 RF GND
17 SESTEM RESET
18 L-CH OUT
19 VG B
20 R-CH OUT
21 VG A
22 SCK
23 M UNREG
24 A DATA
TO VA-62 (1/3) BOARD CN551 (AUDIO(1))
(See page 189.)
CN401
1 UNREG
2 JC MONO / STE DET
3 Hi-Fi / WIND
4 MIC R IN
5 MIC GND
6 MIC L IN
7 MIC 5V
TO MC-43P BOARD CN801
(See page 202.)
W402
1 AUDIO L IN/OUT
2 AUDIO GND
3 AUDIO R IN/OUT
4 AFM OUT GND
5 AFM L OUT
6 AFM R OUT
7 AFM IN GND
8 N.C
9 N.C
NO MOUNT
CN402
1 HP L OUT
2 HP GND
3 HP R OUT
NO MOUNT
no mark : REC/PB mode (SP mode)
( ) : REC mode
( ) : PB mode


17
18
19
20
21
22
MC-43P BOARD
Q801 LOW-CUT ON/OFF SWITCH
Q802 LOW-CUT FILTER
Q803 LOW-CUT ON/OFF SWITCH
Q805 MIC B+ REC
IC801 MIC AMP
SW801 BUILT IN MIC
HIFI OFF ON WIND
Q806 LOW-CUT ON/OFF SWITCH
Q807 LOW-CUT FILTER
Q808 LOW-CUT ON/OFF SWITCH
Q810 JACK MONO/ STEREO SWITCH
Q811 JACK MONO/ STEREO SWITCH
Q812 JACK MONO/ STEREO SWITCH
Q813 STEREO SWITCH
Q815 CURRENT LIMITER
Q816 CURRENT LIMITER

• Signal path

	AUDIO Signal
REC	➡
PB	⇨

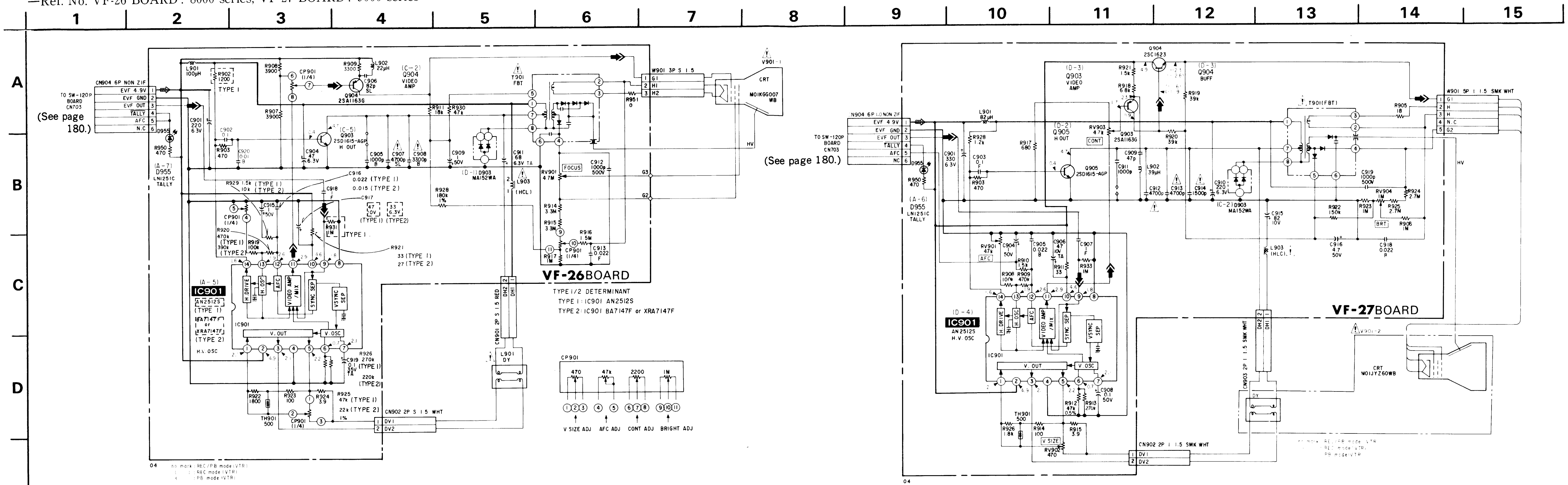

15
16
17
18
19
20
21
22
23
24
25
26
27
e page 189.)
e page 202.)
MJ-40P BOARD
MIC PLUG IN POWER
DC OUT
STEREO MIC UNIT
J751
J752
L751 1μH
L752 1μH
L753 1μH
L754 1μH
L755 1μH
C751 100P
C752 100P
C753 100P
C754 100P
C755 100P
C756 100P
CN752 4P TO MIC
MIC IN L
MIC IN R
MIC GND
MIC 5V
CN751 12P
L IN
L OUT
R OUT
R IN
GND
DC OUT
DC GND
NC
MIC IN L
MIC IN R
MIC GND
MIC 5V
MC-43P BOARD
Q801 LOW-CUT ON/OFF SWITCH
Q802 LOW-CUT FILTER
Q803 LOW-CUT ON/OFF SWITCH
Q805 MIC B+ REC
Q817 RIPPLE FILTER
CN802 12P
Q802 2SC4081
Q803 DTA144EU
Q801 2SK94
Q805 2SC4081
Q807 2SC4081
Q808 DTA144EU
Q806 2SK94
Q808 LOW-CUT ON-OFF SWITCH
IC801 MIC AMP
IC801 μPC4572G2
Q817 2SC4081
HIFI
SW801
BUILT IN MIC
OFF
ON
WIND
Q806 LOW-CUT ON/OFF SWITCH
Q807 LOW-CUT FILTER
Q815 2SC4081
Q811 DTA144EU
Q810 2SC4081
Q812 2SC4081
Q813 FMG2
Q816 2SA1576
W801
MIC 5V
MIC L IN
MIC GND
MIC R IN
HIFI/WIND
JACK MONO/STEREO
UN REG
TO AU-60P BOARD CN401
(See page 200.)
Q810 JACK MONO/ STEREO SWITCH
Q811 JACK MONO/ STEREO SWITCH
Q812 JACK MONO/ STEREO SWITCH
Q813 STEREO SWITCH
Q815 CURRENT LIMITER
Q816 CURRENT LIMITER
no mark: REC/PB mode (VTR)
( ): REC mode
< >: PB mode

• Signal path

	AUDIO Signal
REC	➡
PB	⇨

VF-26, VF-27 (VIEWFINDER) PRINTED WIRING BOARD and SCHEMATIC DIAGRAM

—Ref. No. VF-26 BOARD : 8000 series, VF-27 BOARD : 9000 series—



1
2
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6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
TO SW-120P BOARD CN703
(See page 180.)
CN904 6P NON ZIF
EVF 4.9V
EVF GND
EVF OUT
TALLY
AFC
N.C
D955 LN1251C TALLY
IC901 AN2512S (TYPE 1) BA7147F or XRA7147F (TYPE 2)
H.V. OSC
H. DRIVE
VIDEO AMP /MIX
SYNC SEP
V. OUT
V. OSC
Q903 2SD1615-AGP H OUT
Q904 2SA1163G VIDEO AMP
T901 FBT
W901 3P S 1.5
G1
H1
H2
CRT M01KG007WB
V901-1
FOCUS
HV
G3
G2
CN902 2P S 1.5 WHT
DV1
DV2
L901 DY
CN901 2P S 1.5 RED
DH2
DH1
VF-26BOARD
TYPE 1/2 DETERMINANT
TYPE 1 : IC901 AN2512S
TYPE 2 : IC901 BA7147F or XRA7147F
CP901
V SIZE ADJ
AFC ADJ
CONT ADJ
BRIGHT ADJ
04
no mark : REC/PB mode (VTR)
( ) : REC mode (VTR)
⟨ ⟩ : PB mode (VTR)
TO SW-120P BOARD CN703
(See page 180.)
CN904 6P LO NON ZIF
Q903 VIDEO AMP
Q904 2SC1623 BUFF
Q905 H OUT
T901 (FBT)
W901 5P 1 1.5 SMK WHT
G1
H
H
N.C
G2
HV
BRT
AFC
V SIZE
RV902
IC901 AN2512S H.V. OSC
VF-27BOARD
V901-2
CRT M01JYZ60WB
CN903 2P 1 1.5 SMK WHT
CN902 2P 1 1.5 SMK WHT
DV1
DV2
DY
04

• Signal path

	VIDEO Signal		
	CHROMA	Y	Y/CHROMA
REC	➡	➡»	➡»»
PB	⇨	⇨»	⇨»»

< DIODE >

D903	8-719-400-20	MA152WA
D955	8-719-404-19	LN1251C

< IC >

IC901	8-759-420-01	AN2512S (TYPE 1)
IC901	8-759-511-01	BA7147F (TYPE 2)
IC901	8-759-514-92	XRA7147F (TYPE 2)

< TRANSISTOR >

Q903	8-729-106-68	2SD1615-AGP
Q904	8-729-216-31	2SA1163G

< DIODE >

D903	8-719-400-20	MA152WA
D955	8-719-404-19	LN1251C

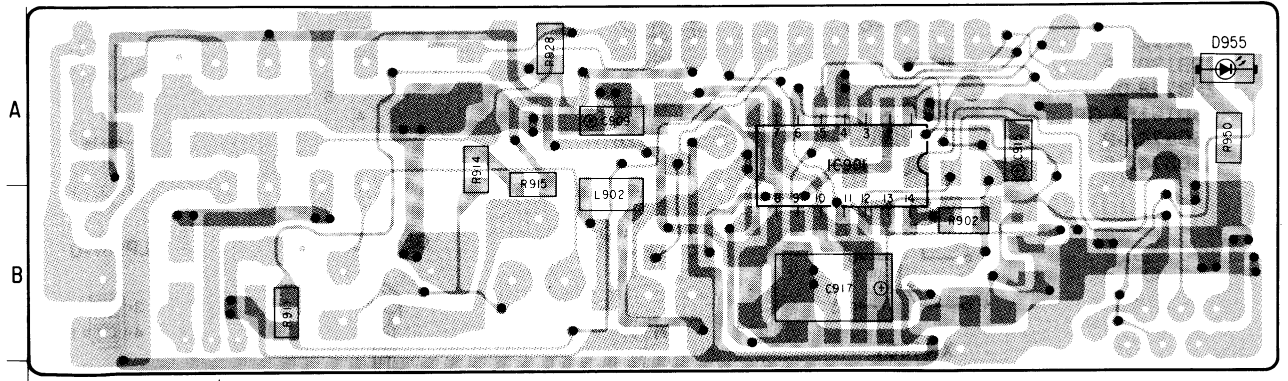
< IC >

IC901	8-759-420-01	AN2512S

< TRANSISTOR >

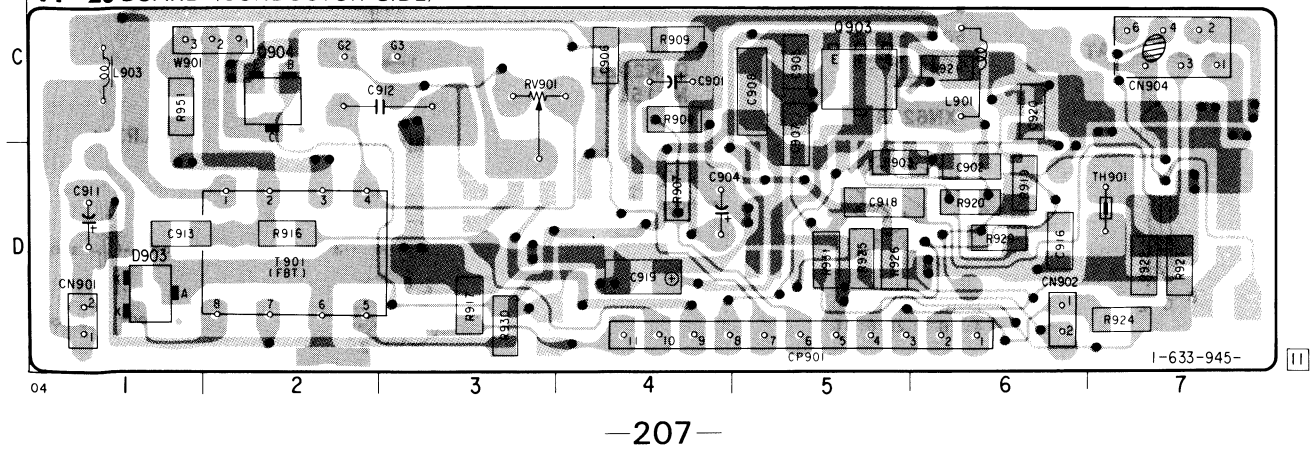
Q903	8-729-216-31	2SA1163G
Q904	8-729-100-66	2SC1623
Q905	8-729-106-68	2SD1615-AGP

VF-26 BOARD (COMPONENT SIDE)



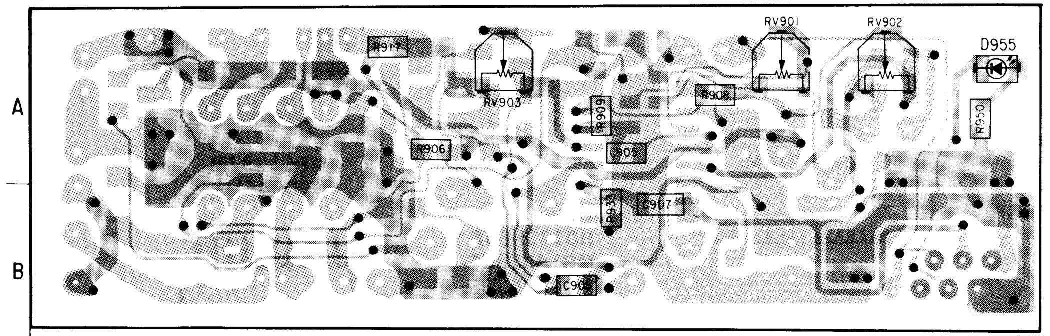
A
B
D955
R928
R950
R914
R915
L902
IC901
R902
C917

VF-26 BOARD (CONDUCTOR SIDE)



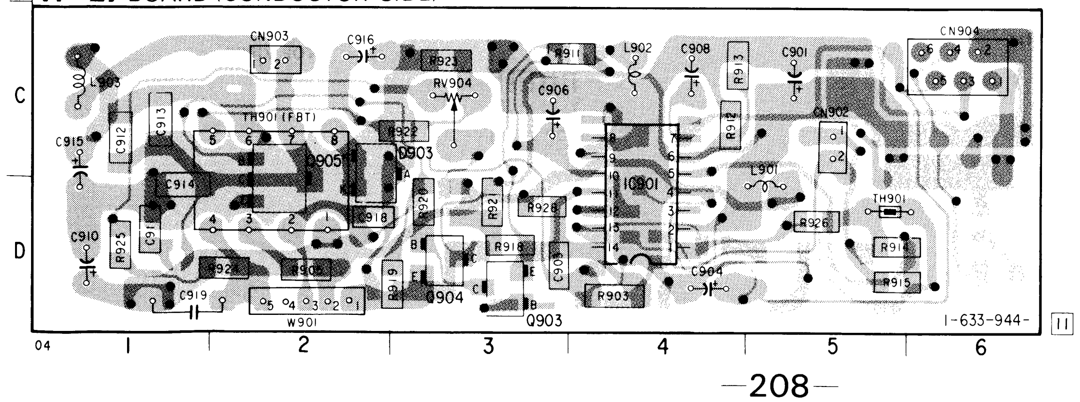
C
D
L903
W901
D904
G2
G3
C912
RV901
R909
CP901
Q903
CN904
R951
C911
C913
R916
D903
T901 (FBT)
CN901
TH901
CN902
R924
C918
C919
1-633-945-
11
04
1
2
3
4
5
6
7

VF-27 BOARD (COMPONENT SIDE)



A
B
RV901
RV902
D955
RV903
R908
R906
R950
C903
C907
C905

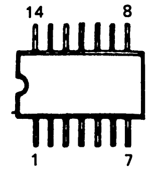
VF-27 BOARD (CONDUCTOR SIDE)



C
D
CN903
C916
RV904
L902
C908
C901
CN904
C906
CN902
TH901 (FBT)
Q905
D903
IC901
L901
TH901
R926
R915
W901
Q904
Q903
R903
C904
C910
C915
C914
C919
1-633-944-
11
04
1
2
3
4
5
6

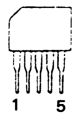
4-3. SEMICONDUCTORS

AN2512S

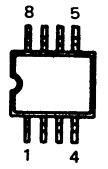


(TOP VIEW)

BA401

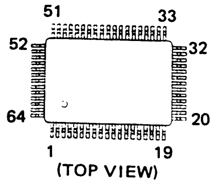


BR93C46
CXL5502M
CXL5502M-2
LM393D
NJM2073M
μPC4572G2



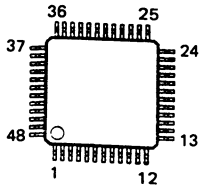
(TOP VIEW)

CF79028PG


51
33
52
32
64
20
1
19

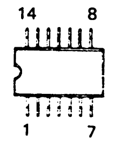
(TOP VIEW)

CF79050PV
CXA-1488R
MB673198U


36
25
37
24
48
13
1
12

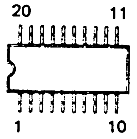
(TOP VIEW)

CX20095A
MC14066BF
TL1596CDB



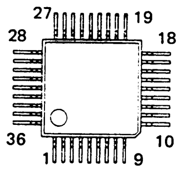
(TOP VIEW)

CX20102
μPD7564G-540



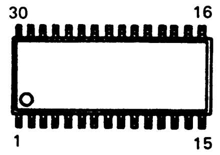
(TOP VIEW)

CXA-1536Q


27
19
28
18
36
10
1
9

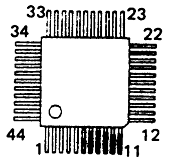
MARKING SIDE VIEW

CXA1127M
CXA8006M

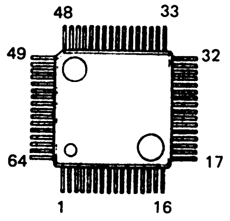


(TOP VIEW)

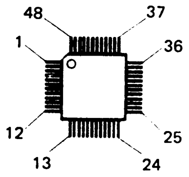
CXA1204Q
M51285BGP


33
23
34
22
44
12
1
11

CXA1207R
CXD1205R


48
33
49
32
64
17
1
16

CXA1208R
CXA1392R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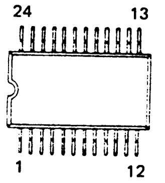
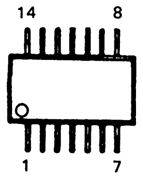
37
1
36
12
25
13
24

CXA1393AN



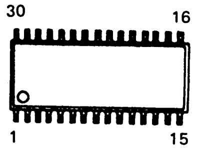
(TOP VIEW)

CXA8010M
LM324D



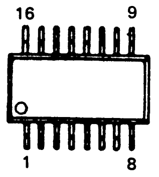
(TOP VIEW)

CXA8016M



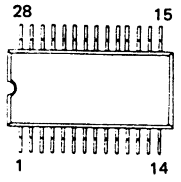
(TOP VIEW)

CXD-2107M
CXD1172AM



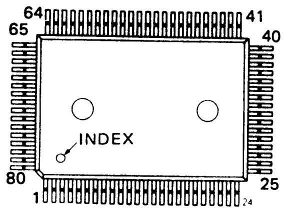
(TOP VIEW)

CXK58257M-10L



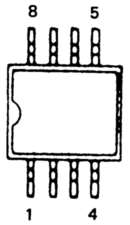
(TOP VIEW)

CXP80116-806Q
MC14094BF
μPD75316GF-075


64
41
65
40
INDEX
80
25
1
24

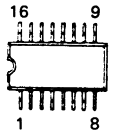
MARKING SIDE VIEW

HA118070FP



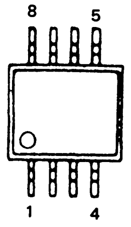
(TOP VIEW)

HD14053BF
MC14028BF
MC14053BF
TC4028BF

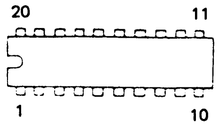


(TOP VIEW)

LM358D
NJM2234M
NJM2235M
RC3414M

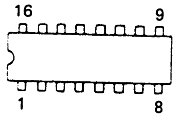


MB88341PFV



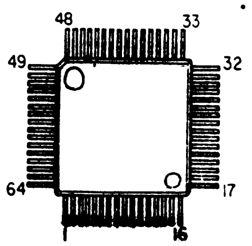
(TOP VIEW)

MC10H116M

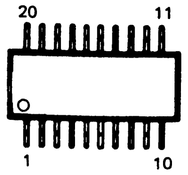


(TOP VIEW)

MC68HC11E9FU

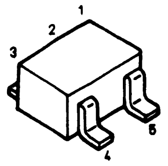

48
33
49
32
64
17
16

MPC1737M
UPD6451G

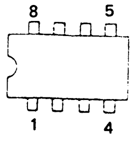


(TOP VIEW)

NJM2107F
SC14S66F
TC7S08F
TC4S66F

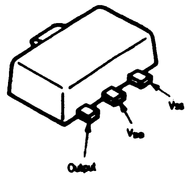


NJM2233AM

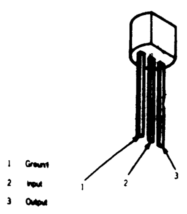


(TOP VIEW)

S-8054ALB-LM-S


Vss
Vdd
Output

S-81250HG-RD-S


1 Ground
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3 Output
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2SA1163G
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2SA1576-S
2SA1611-M5M6
2SB624-BV345
2SC1623
2SC2223-F13
2SC3326N
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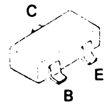
UN5213
UN5215



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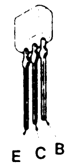

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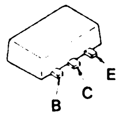

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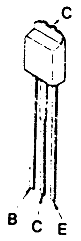

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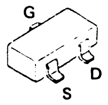

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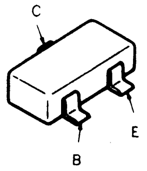

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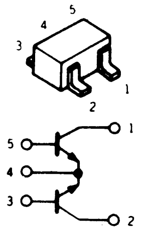
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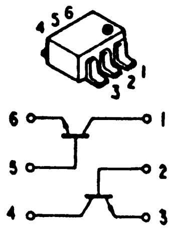
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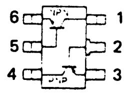

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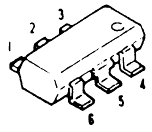

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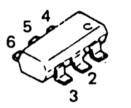
XN6501



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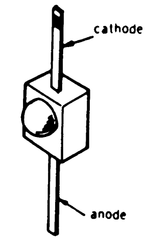
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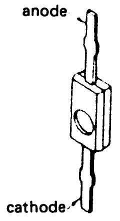
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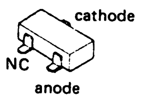
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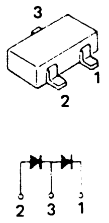

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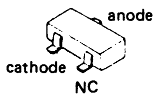
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cathode
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DTZ12
DTZ9.1
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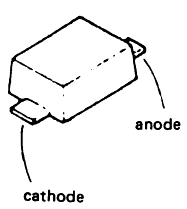
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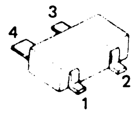

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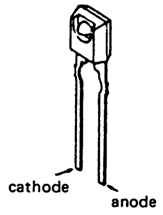
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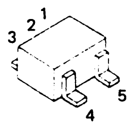

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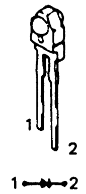

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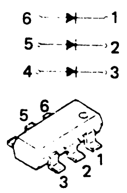
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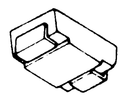
LN1251C



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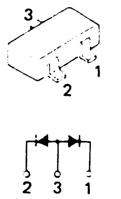

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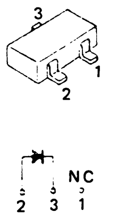

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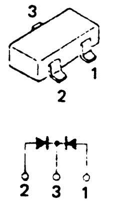

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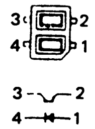

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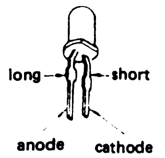

long
short
anode
cathode

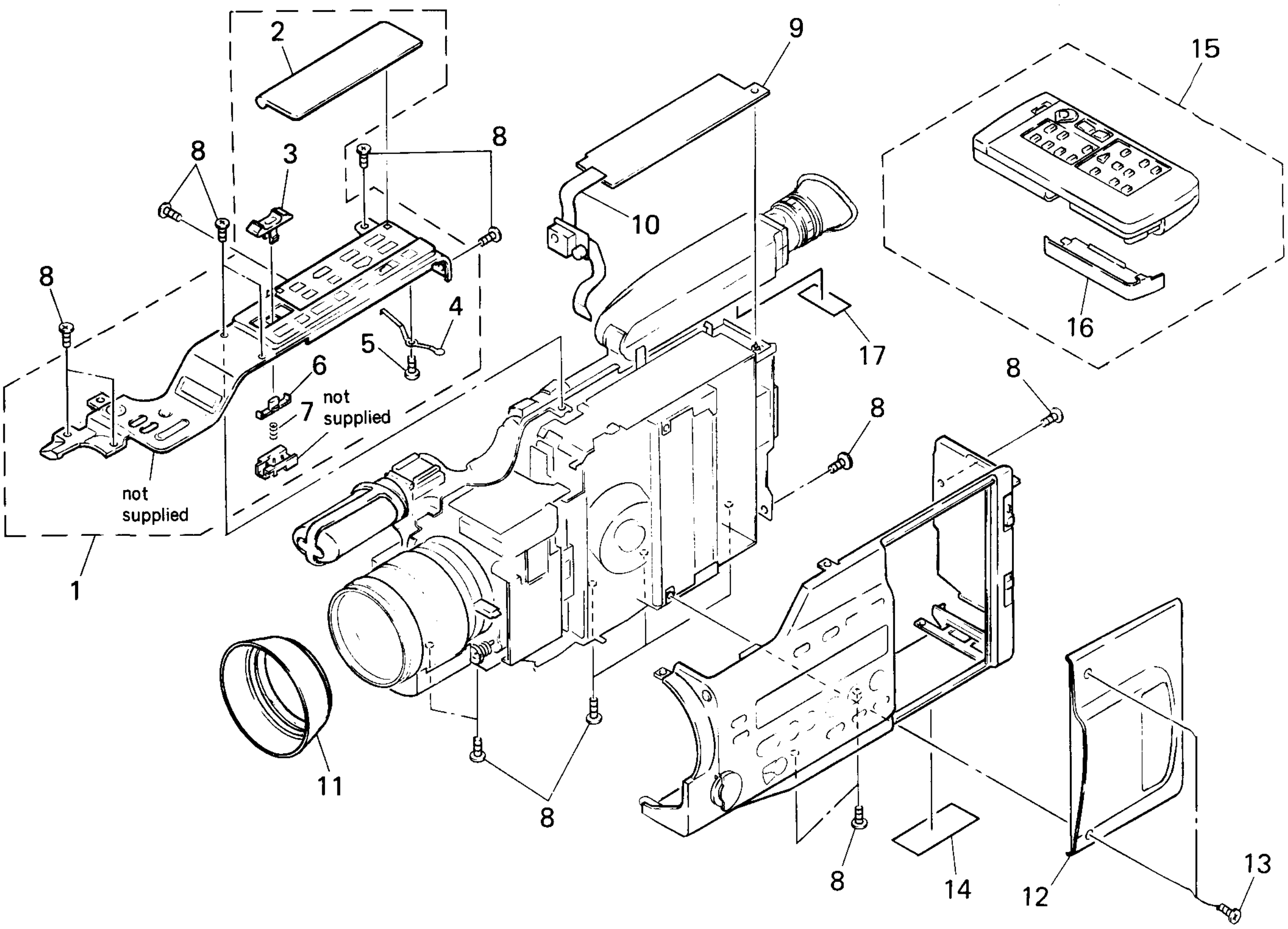
SECTION 5
EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE)...(RED)
  ↑ Parts Color ↑ Cabinet's Color
- Hardware(# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

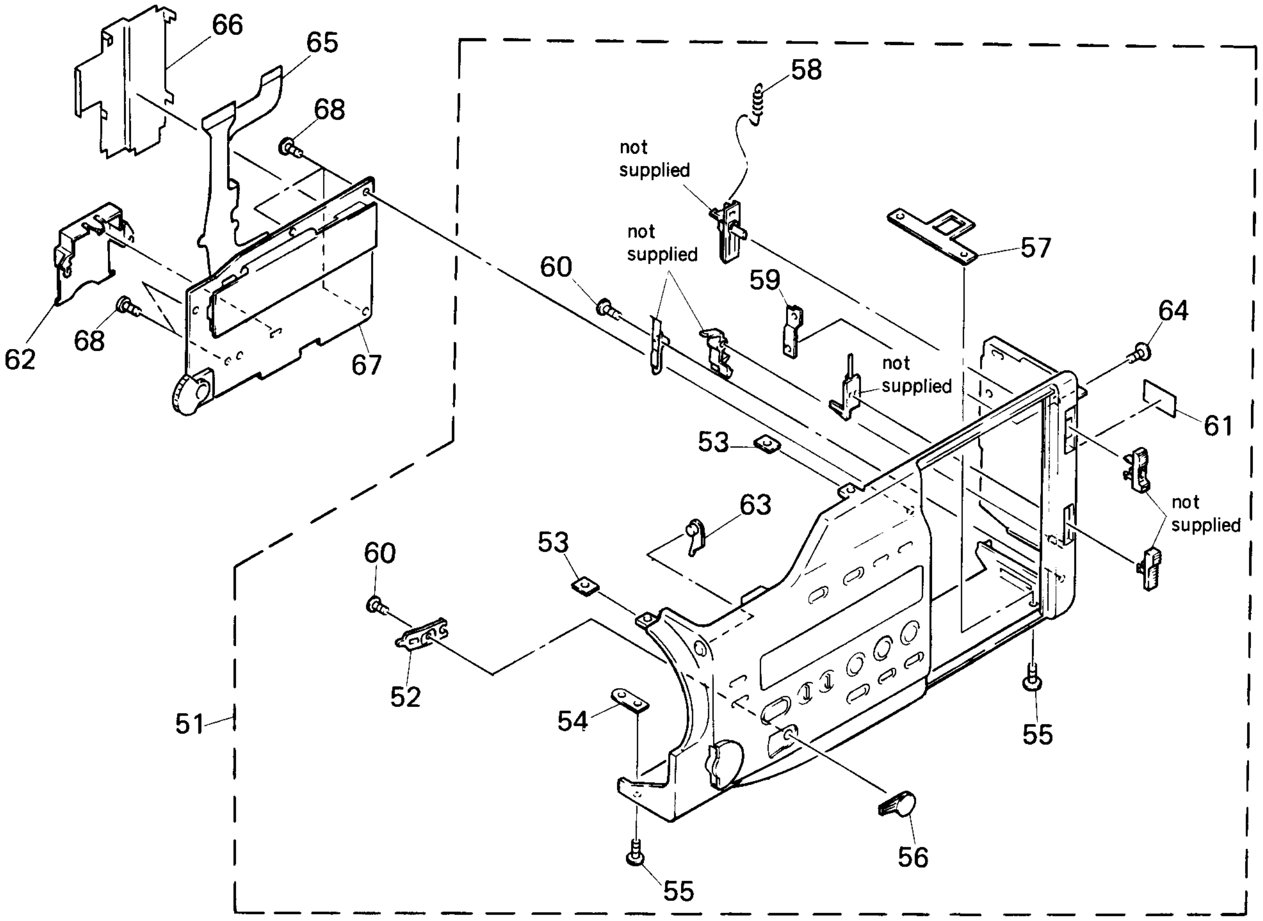
5-1. CABINET (UPPER) ASSEMBLY



Ref. No.	Part No.	Description	Remark
1	X-3940-424-1	CABINET (UPPER) ASSY	
2	3-744-750-11	LID, UPPER	
3	3-744-723-61	BUTTON (10), POWER	
4	3-744-732-01	SPRING, CLICK	
5	3-713-790-21	SCREW (M2X6), TAPPING, P3	
6	* 3-718-257-11	BUTTON, PUSH, POWER	
7	3-303-973-00	SPRING, COMPRESSION	
8	3-719-381-01	SCREW (M2X4)	
9	* 1-635-932-11	FK-46 BOARD	

Ref. No.	Part No.	Description	Remark
10	1-634-434-11	FP-263 FLEXIBLE BOARD	
11	3-749-136-01	HOOD, LENS	
12	X-3940-423-1	LID ASSY, CASSETTE	
13	3-733-912-11	SCREW (M2X4.5), SPECIAL HEAD	
14	* 3-942-325-01	LABEL, MODEL NUMBER (UK)	
14	* 3-940-623-01	LABEL, MODEL NUMBER (AEP)	
15	1-465-588-41	REMOTE COMMANDER (RMT-503)	
16	3-742-854-01	COVER, BATTERY	
17	* 3-704-235-01	LABEL, CAUTION (UK)	

5-2. CABINET (RIGHT) ASSEMBLY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68
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61
63
not supplied
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52
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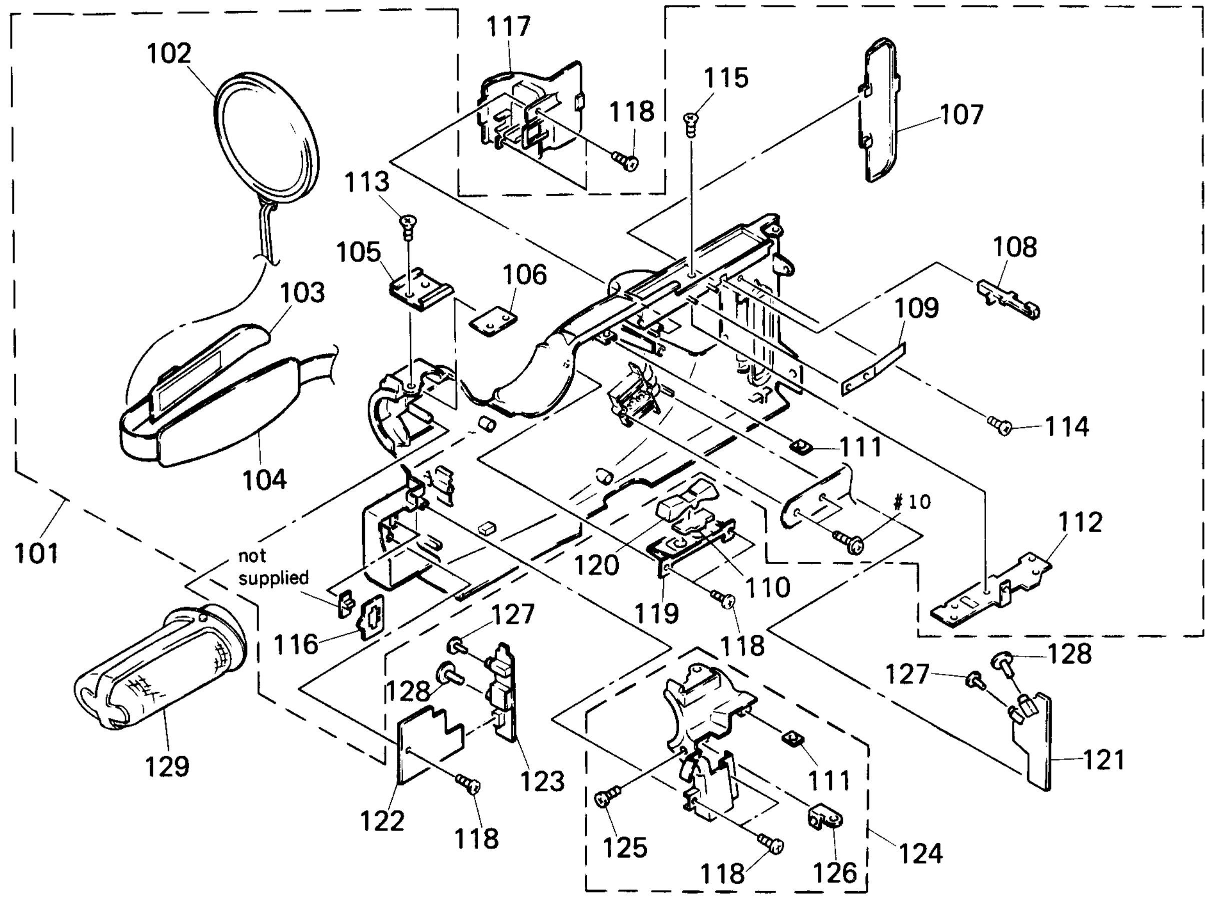
55
56
55

Ref. No.	Part No.	Description	Remark
51	X-3749-211-1	CABINET (R) SUB ASSY	
52	3-744-734-01	LEVER, AUTO	
53	3-718-233-01	NUT, PLATE	
54	3-727-915-01	NUT, PLATE	
55	3-719-381-01	SCREW (M2X4)	
56	3-744-733-51	KNOB, AUTO	
57	3-744-740-01	SHEET METAL (A), STRAP	
58	3-674-402-00	SPRING, TENSION	
59	3-744-741-01	SHEET METAL, R	
60	4-908-792-51	SCREW (B2X5), TAPPING, P1	
61	* 3-719-683-01	LABEL, BATTERY FITTING	
62	3-744-797-11	HOLDER, LITHIUM	
63	3-727-922-01	PLATE, LIGHT GUIDE, REC	
64	3-744-720-11	SCREW (M2X3)	
65	1-634-433-11	FP-262 FLEXIBLE BOARD	
66	* 3-746-220-01	CASE, SHIELD, FD	
67	* A-7062-667-A	FD-15P BOARD, COMPLETE	
68	3-713-790-11	SCREW (M2X5), TAPPING, P3	

5-3. CABINET (GRIP) ASSEMBLY



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121
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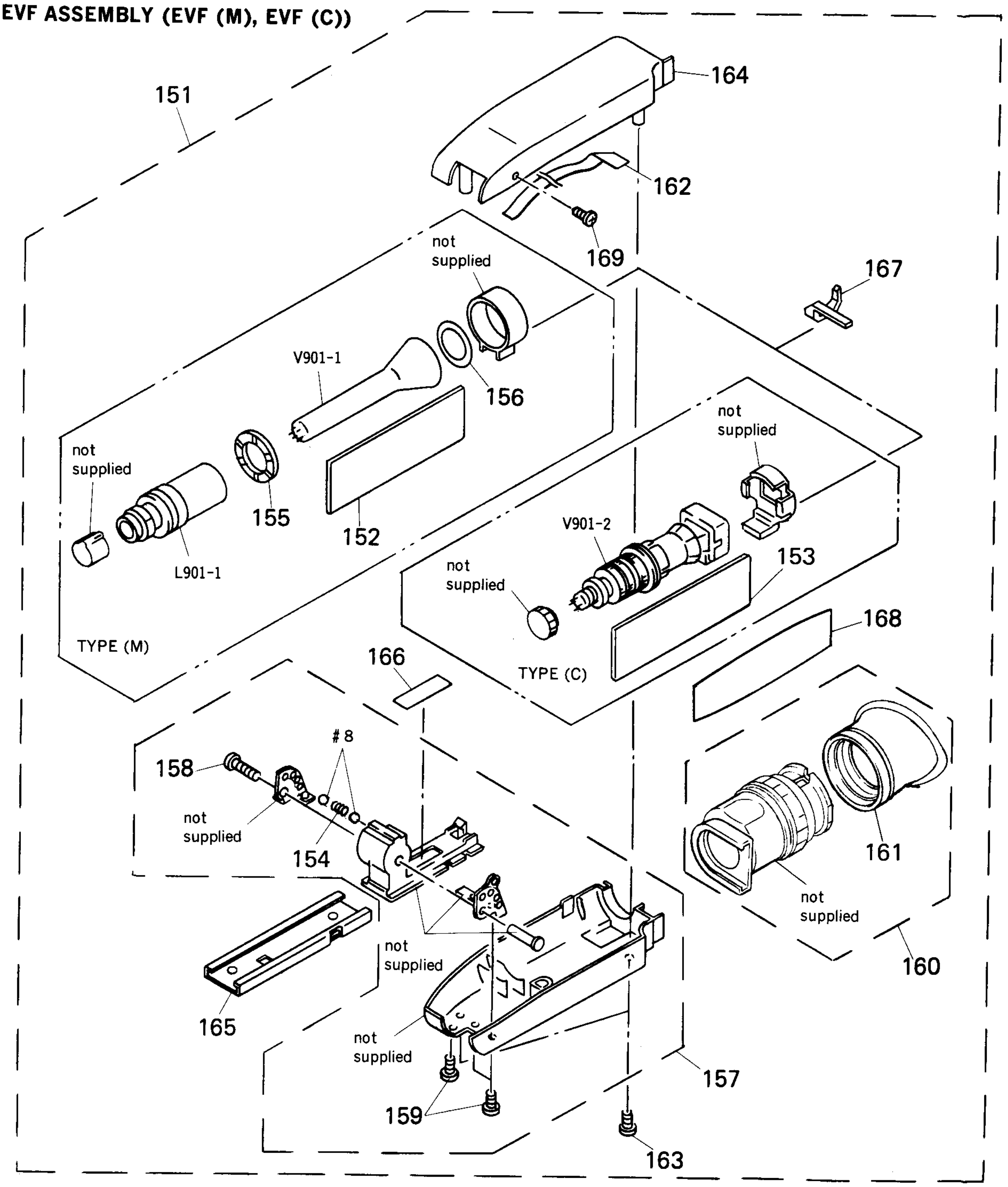
118
126

Ref. No.	Part No.	Description	Remark
101	X-3940-425-1	CABINET (G) SUB ASSY	
102	X-3749-012-1	CAP ASSY, HOOD	
103	3-739-866-81	BELT, GRIP	
104	3-724-591-01	PAD, GRIP	
105	3-724-511-01	SHOE, ACCESSORY	
106	3-744-739-01	NUT (10), LINING PLATE	
107	3-744-704-55	LID, CONNECTOR	
108	3-744-709-01	LOCK, SLIDE	
109	3-744-717-01	SPRING, LOCK	
110	* 3-746-251-01	SHEET, Z	
111	3-718-233-01	NUT, PLATE	
112	* 3-744-754-01	BRACKET, VF	
113	3-742-871-11	SCREW (M2X4)	
114	3-713-790-11	SCREW (M2X5), TAPPING, P3	
115	3-742-871-21	SCREW (M2X3)	

Ref. No.	Part No.	Description	Remark
116	3-744-735-01	RETAINER, M	
117	X-3749-209-1	BASE ASSY, SP	
118	3-713-790-11	SCREW (M2X5), TAPPING, P3	
119	X-3744-772-1	RETAINER ASSY, Z	
120	1-572-320-31	SWITCH, PUSH	
121	1-634-422-11	SW-120P BOARD	
122	A-7062-089-A	MC-43P BOARD, COMPLETE	
123	A-7071-215-A	MJ-40P BOARD, COMPLETE	
124	X-3749-016-1	CABINET ASSY, MICROPHONE	
125	3-719-381-01	SCREW (M2X4)	
126	3-744-744-01	NUT, M PLATE	
127	3-728-266-01	COVER, 2.5 JACK	
128	3-728-267-01	COVER, 3.5 JACK	
129	1-542-150-11	MICROPHONE, STEREO	

5-4. EVF ASSEMBLY (EVF (M), EVF (C))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TYPE (C)
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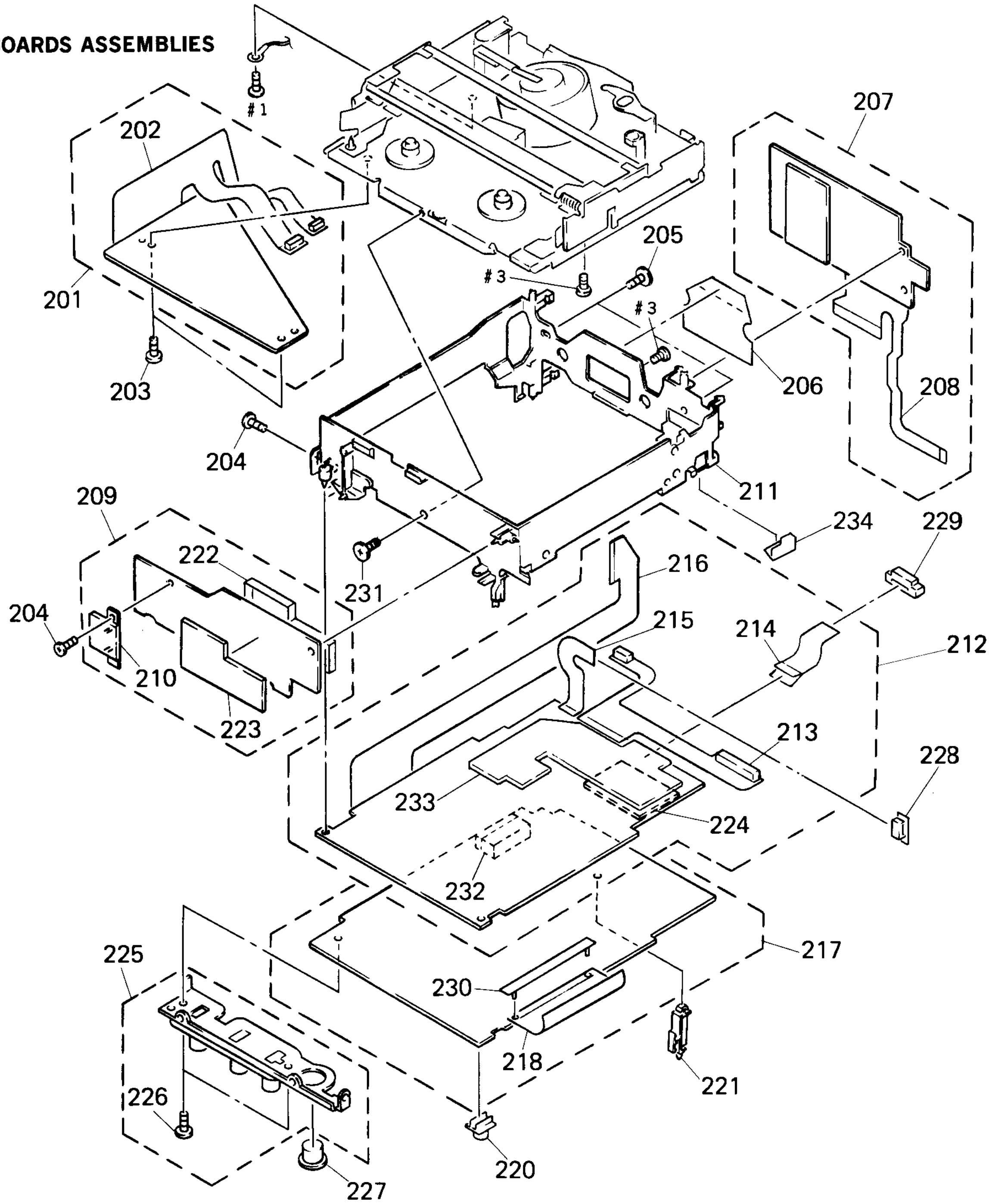
161
not supplied
160
not supplied
165
not supplied
157
159
163

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
151	A-7019-288-A	EVF (M) ASSY	
	A-7019-289-A	EVF (C) ASSY	
152	* A-7062-278-A	VF-26P BOARD, COMPLETE	
153	* A-7062-279-A	VF-27P BOARD, COMPLETE	
154	3-302-492-00	SPRING, COMPRESSION	
155	3-724-549-01	LOCK, CRT	
156	3-724-570-01	RING, CRT FIXED	
157	X-3749-019-1	CASE ASSY, LOWER, VF	
158	3-732-012-11	SCREW (M2X5)	
159	3-744-720-11	SCREW (M2X3)	
160	X-3940-326-1	FINDER (S) ASSY, SPORTS	
161	3-749-142-01	EYE CUP	

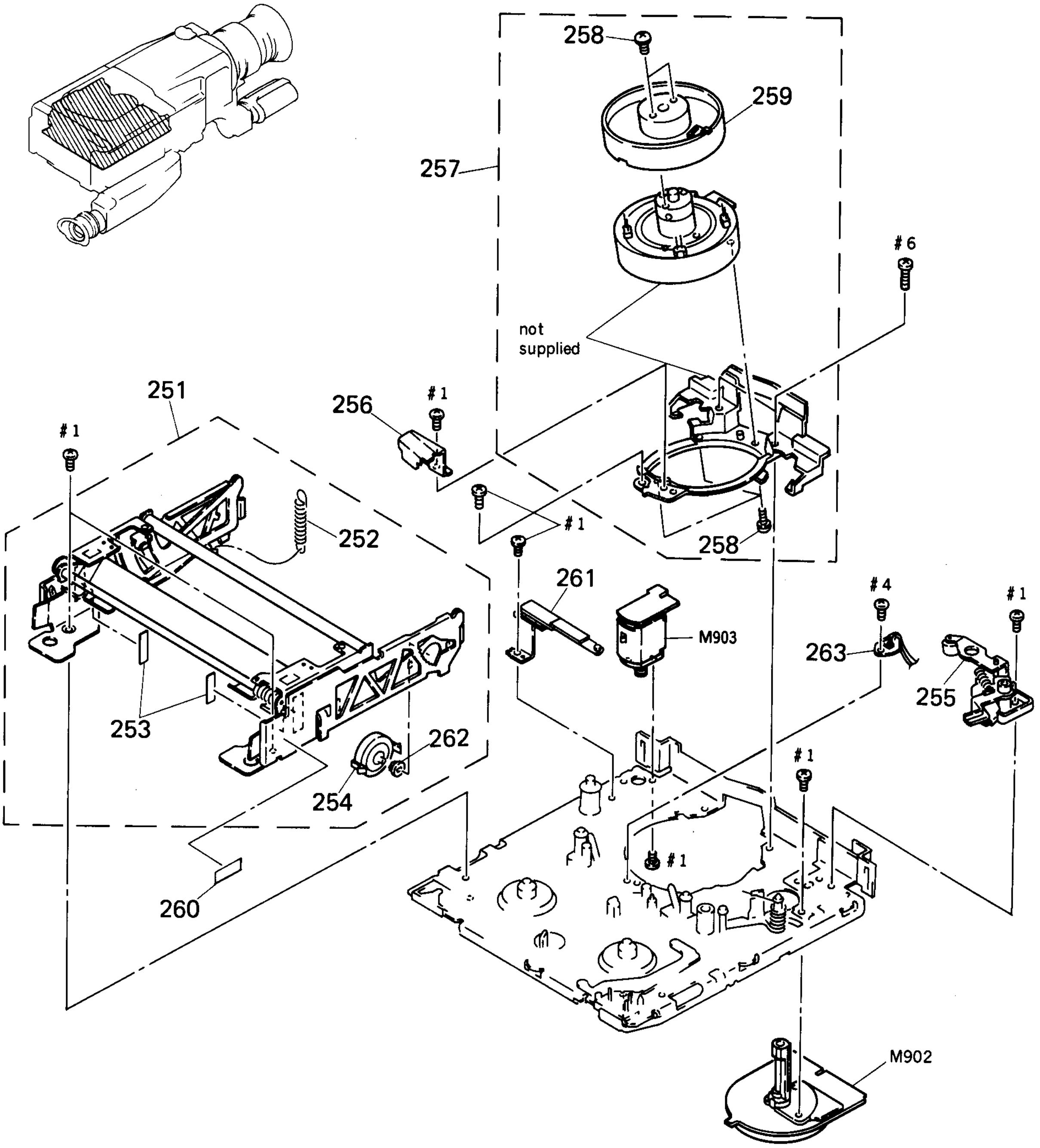
Ref. No.	Part No.	Description	Remark
162	1-634-011-11	FP-264 FLEXIBLE BOARD	
163	3-713-790-31	SCREW (M2X8), TAPPING, P3	
164	3-744-705-31	CASE, VF (UPPER)	
165	3-744-712-01	SHOE, VF	
166	3-744-716-01	COVER, FL	
167	3-744-722-01	GUIDE, VF TALLY	
168	3-744-775-01	INSULATOR, VF	
169	3-719-381-01	SCREW (M2X4)	
L901-1⚠	1-451-310-21	DEFLECTION YOKE (B/W)	
V901-1⚠	1-546-085-11	CATHODE-RAY TUBE, B/W (M01KG[illegible]07WB)	
V901-2⚠	1-452-482-11	CRT ASSY (M91JYZ60WB)	

5-5. MAIN BOARDS ASSEMBLIES



Ref. No.	Part No.	Description	Remark
201	* A-7062-665-A	CC-33P BOARD, COMPLETE	
202	1-634-429-11	FP-258 FLEXIBLE BOARD	
203	3-713-790-11	SCREW (M2X5), TAPPING, P3	
204	3-719-381-01	SCREW (M2X4)	
205	3-732-791-01	SCREW (M2X3)	
206	* 3-746-201-01	PLATE, SHIELD, AM	
207	* A-7062-328-A	AU-60P BOARD, COMPLETE	
208	1-634-432-11	FP-261 FLEXIBLE BOARD	
209	* A-7062-663-A	FU-71P BOARD, COMPLETE	
210	1-537-241-11	TERMINAL BOARD (BATTERY)	
211	3-744-779-01	FRAME, MD	
212	* A-7062-664-A	SS-133 BOARD, COMPLETE	
213	1-634-428-11	FP-257 FLEXIBLE BOARD	
214	1-634-427-11	FP-256 FLEXIBLE BOARD	
215	1-634-426-11	FP-255 FLEXIBLE BOARD	
216	X-3744-764-1	FP259 ASSY	
217	* A-7062-325-A	VA-62 BOARD, COMPLETE	
218	1-634-431-11	FP-260 FLEXIBLE BOARD	
220	3-744-743-01	KNOB, 10 SELECTION	
221	3-744-757-01	SUPPORT (10), C	
222	* X-3744-706-1	CASE ASSY, SHIELD, FU	
223	* X-3744-707-1	LID ASSY, REAR, FU SHIELD	
224	* A-7068-183-A	HR-10P BOARD, COMPLETE	
225	A-7091-210-A	PLATE ASSY, JACK	
226	3-744-720-11	SCREW (M2X3)	
227	1-566-850-31	CONNECTOR, (S) TERMINAL 4P	
228	1-569-346-11	CONNECTOR, FPC(TRANSLATION) 10P	
229	1-569-347-11	CONNECTOR, FPC(TRANSLATION) 13P	
230	X-3744-720-1	HOLDER ASSY, FP	
231	3-732-791-31	SCREW (M2X3)	
232	* X-3744-712-1	CASE ASSY, SHIELD, VA	
233	* X-3744-711-1	LID ASSY, REAR, RP	
234	3-940-504-01	COVER, CAP	

5-6. MECHANICAL ASSEMBLY (1)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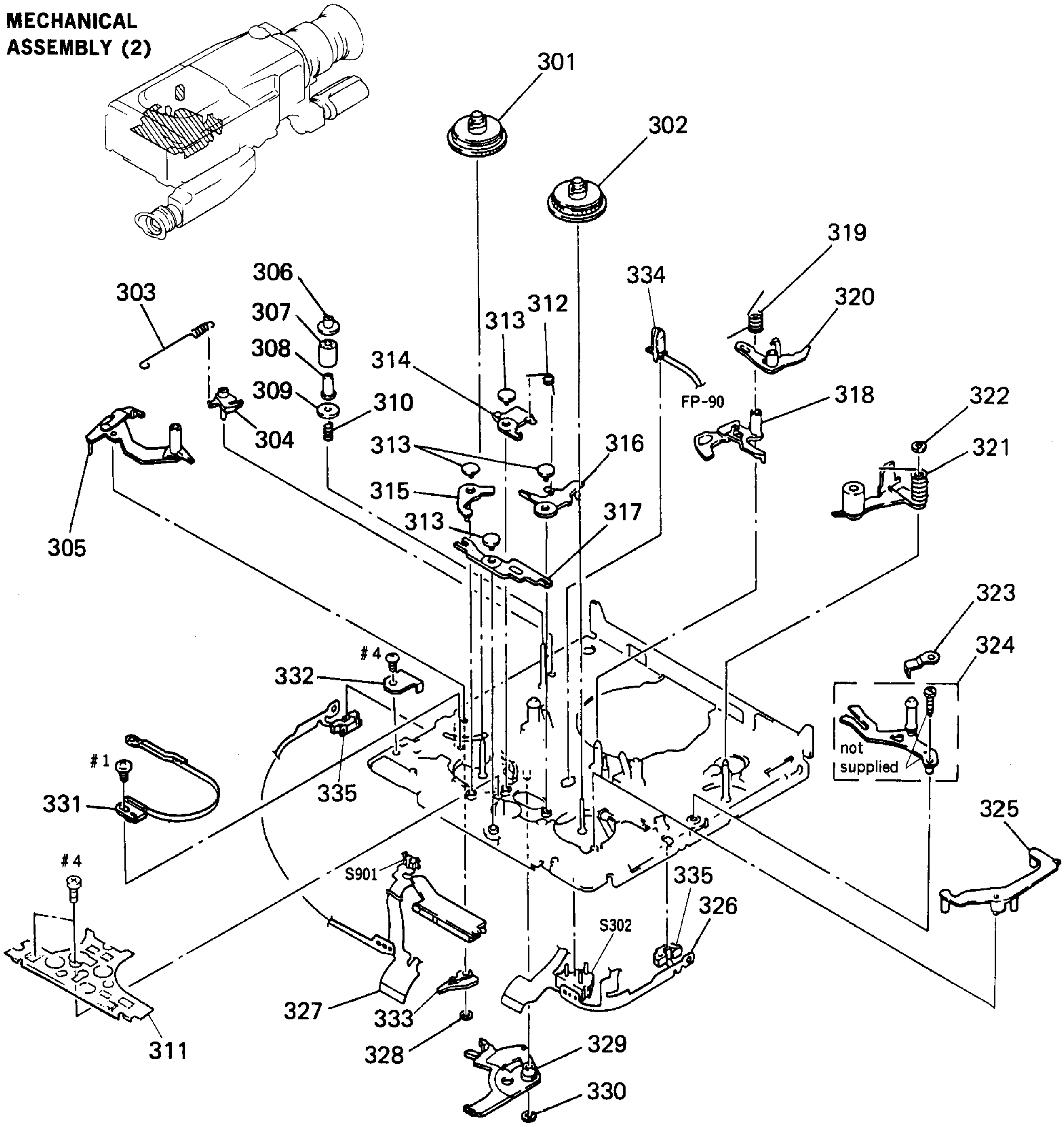
#1
#1
260
M902

Ref. No.	Part No.	Description	Remark
251	X-3728-873-1	CASSETTE COMPARTMENT ASSY	
252	3-728-825-03	SPRING, TENSION	
253	* 3-728-829-01	TAPE	
254	3-728-867-02	DAMPER, OIL	
255	A-7040-207-A	ROLLER BLOCK ASSY, HC	
256	3-728-868-01	GUARD, GUIDE	
257	A-7048-403-A	DRUM ASSY (DGU-62A-R)	
258	3-686-493-01	SCREW (M2X5), P1	
259	A-7049-341-A	DRUM ASSY, ROTARY (UPPER) (DGR-62-R)	
260	* 3-730-176-11	SHEET, MD	
261	X-3728-864-1	GROUND ASSY, SHAFT	
262	3-728-828-02	GEAR, DAMPER	
263	1-808-505-12	SENSOR (DEN)	
M902	8-835-331-01	MOTOR, DC U-22A (CAPSTAN)	
M903	A-7040-208-A	MOTOR ASSY, THREADING	

5-7. MECHANICAL ASSEMBLY (2)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FP-90
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S901
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#4
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S302
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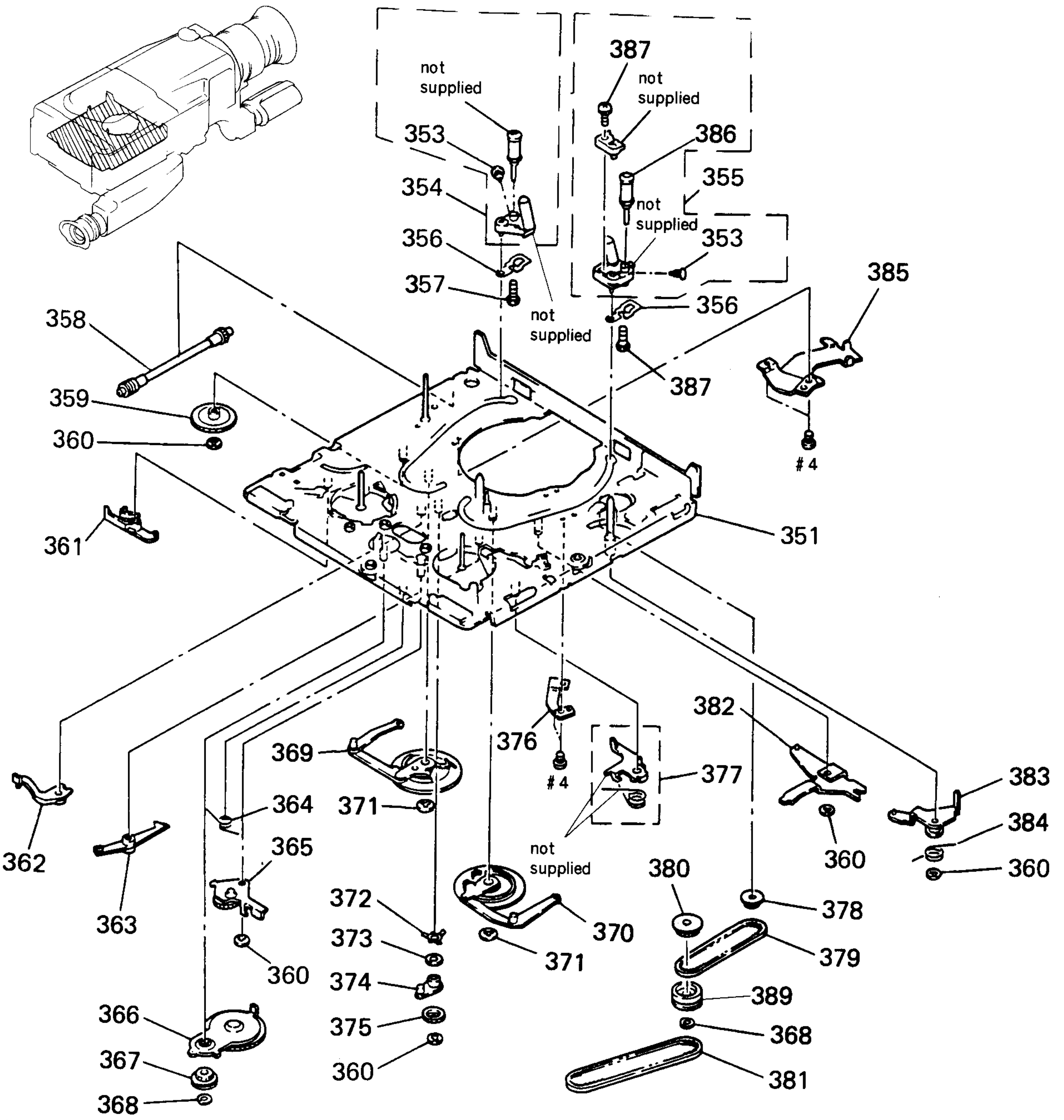
Ref. No.	Part No.	Description	Remark
301	X-3728-851-1	TABLE ASSY, REEL, S	
302	X-3728-855-1	TABLE ASSY, REEL, T	
303	3-736-414-01	SPRING, TENSION	
304	3-728-855-03	ARM, ADJUSTMENT	
305	X-3728-867-1	ARM ASSY (S),TENSION REGULATOR	
306	3-726-884-01	FLANGE, UPPER, TG2	
307	3-726-883-01	ROLLER, TG2	
308	3-726-885-01	SLEEVE, TG2	
309	3-726-882-02	FLANGE, LOWER, TG2	
310	3-726-886-01	SPRING, COMPRESSION	
311	3-741-195-01	PLATE, BLIND, RK	
312	3-726-866-01	SPRING (ST), TORSION	
313	3-726-858-01	PIN, SHAFT RETAINER	
314	3-728-849-01	BRAKE, S	
315	3-726-852-01	BRAKE, LB	
316	3-728-850-01	BRAKE, T	
317	3-726-853-01	LEVER, LB	
318	3-728-875-01	STOPPER, RK	
319	3-726-864-01	SPRING (RK), TORSION	
320	3-728-852-02	ARM, RK STOPPER	
321	A-7040-219-A	ARM BLOCK ASSY, PINCH	
322	3-669-465-00	WASHER (1.5), STOPPER	
323	3-728-808-01	SPRING, LEAF	
324	X-3728-869-1	ARM ASSY, TG7	
325	3-728-848-01	ARM, LB RELEASE	
326	1-628-061-12	FP-90 FLEXIBLE BOARD	
327	1-628-060-12	FP-89 FLEXIBLE BOARD	
328	3-321-393-11	WASHER, STOPPER	
329	X-3728-863-1	LEVER ASSY, SW	
331	X-3728-859-1	BAND ASSY, TENSION REGULATOR	
332	3-730-125-01	RETAINER, SW	
333	X-3728-857-1	STOPPER ASSY,TENSION REGULATOR	
334	3-728-837-01	HOLDER, LED	
335	3-728-869-02	HOLDER, SENSOR	
S302	1-572-298-11	SWITCH, PUSH	
S901	1-571-099-11	SWITCH	

5-8. MECHANICAL ASSEMBLY (3)


387
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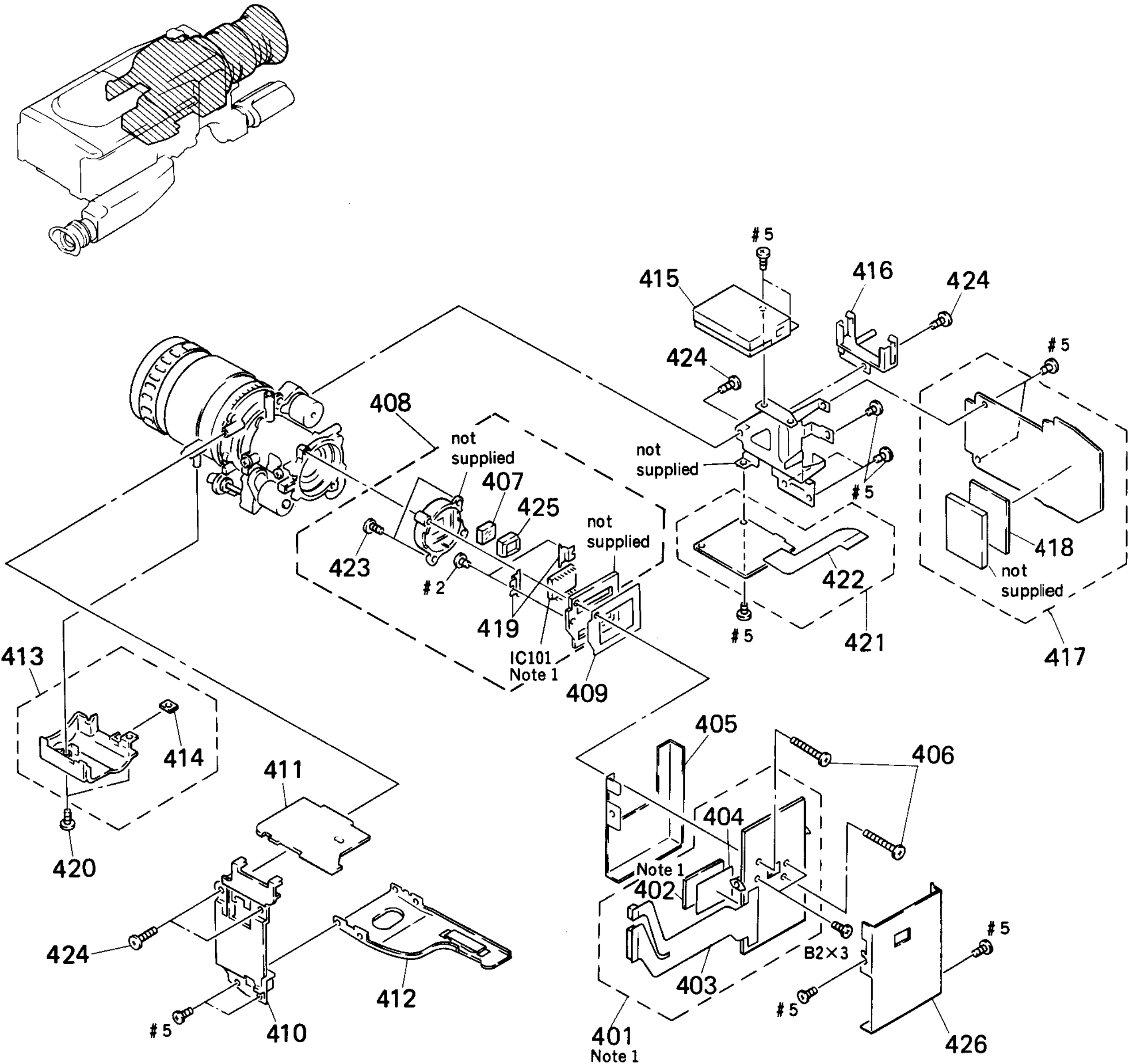
Ref. No.	Part No.	Description	Remark
351	X-3728-862-1	CHASSIS ASSY, MECHANICAL	
352	3-741-196-01	PULLEY (LOWER), BELT MIDWAY	
353	3-726-822-01	SCREW (M1.4X2) (STEP), HEAD	
354	A-7040-204-A	COASTER (LEFT) BLOCK ASSY	
355	A-7040-215-A	COASTER (RIGHT) BLOCK ASSY (N1S)	
356	3-736-485-01	SPRING, LEAF, COSTER	
357	3-726-830-01	SCREW (M1.4X4) (THREE LOCK)	
358	X-3728-868-1	WORM ASSY	
359	3-744-109-01	GEAR, WHEEL	
360	3-726-829-01	WASHER, STOPPER	
361	3-728-842-01	LEVER, EJECT	
362	3-728-851-01	BRAKE, UL	
363	3-726-854-01	ARM, BRAKE RELEASE	
364	3-726-865-01	SPRING (LB), TORSION	
365	A-7040-225-A	GEAR BLOCK ASSY (N), LB	
366	X-3728-866-1	GEAR ASSY, RK	
367	X-3728-858-1	GEAR ASSY, RC	
368	3-321-393-11	WASHER, STOPPER	
369	X-3728-842-1	GEAR (LEFT) ASSY, DRIVE	

Ref. No.	Part No.	Description	Remark
370	X-3728-843-1	GEAR (RIGHT) ASSY, DRIVE	
371	3-669-465-00	WASHER (1.5), STOPPER	
372	3-726-867-01	SPRING, LEAF	
373	3-701-436-21	WASHER, POLYEHTHYLENE	
374	3-726-857-03	ARM, UL	
375	3-726-856-04	GEAR, UL	
376	* 3-726-805-01	REINFORCEMENT (TT)	
377	X-3726-808-2	BRAKE ASSY, TS	
378	X-3726-805-1	GEAR ASSY, JOINT	
379	3-728-866-11	BELT (S), TIMING	
380	X-3726-813-1	PULLEY (UPPER) ASSY, MIDWAY	
381	3-741-197-01	BELT (L), TIMING	
382	3-941-322-01	LEVER, LOADING	
383	X-3726-824-1	ARM ASSY, PINCH SUB	
384	3-726-895-01	SPRING	
385	X-3726-841-1	REINFORCEMENT (SS) ASSY	
386	X-3728-808-4	ROLLER ASSY (U) (SUS), GUIDE	
387	3-736-473-01	SCREW (M2X0.25), P1	

5-9. CARERA BLOCK ASSEMBLY


#5
415
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424
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408
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425
not supplied
not supplied
#5
418
not supplied
417
422
421
#5
423
#2
419
IC101
Note 1
409
413
414
420
411
405
406
404
Note 1
402
424
412
410
#5
B2×3
#5
#5
403
401
Note 1
426

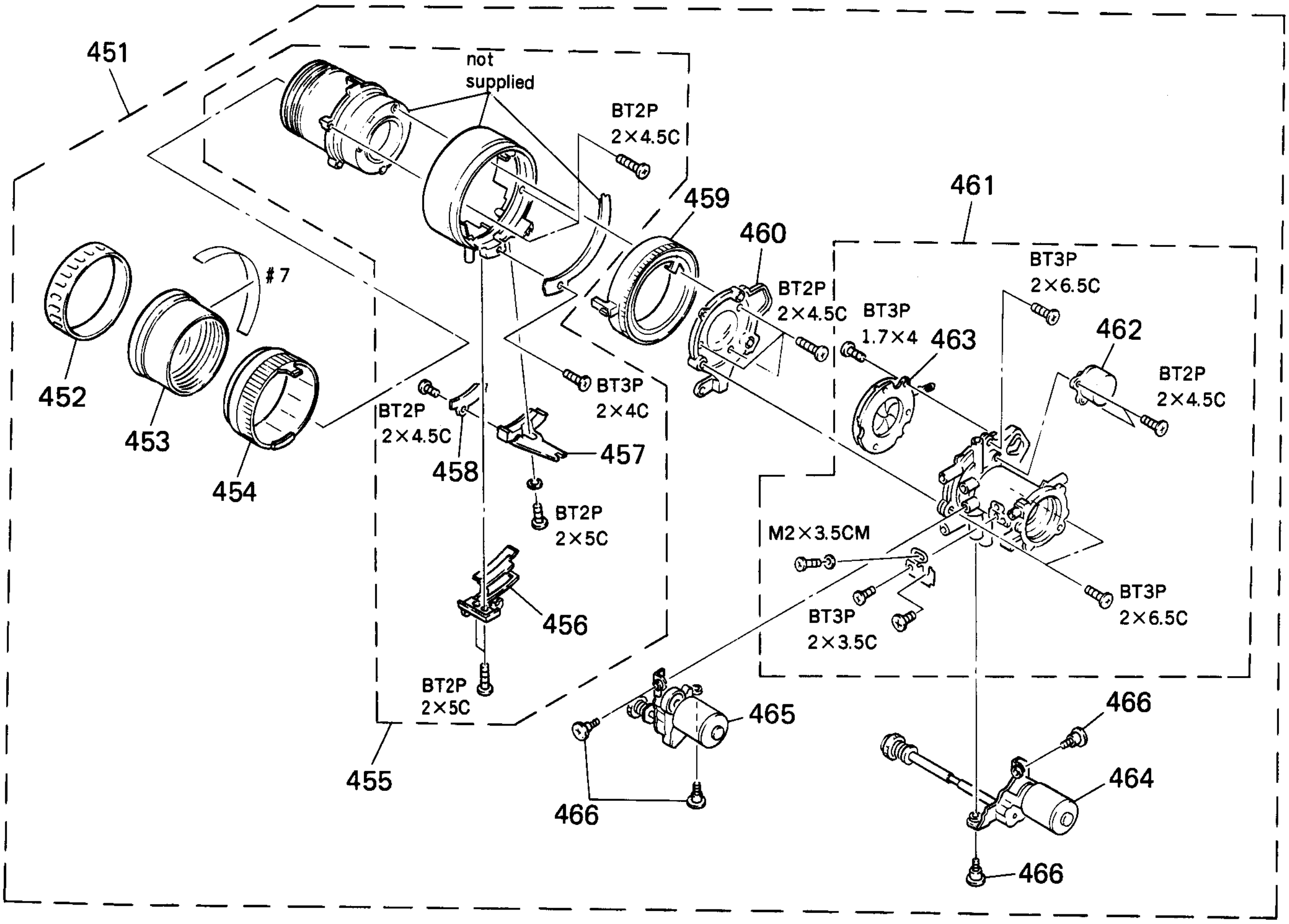
Note 1 : For replacement of CCD imager, CD-20P board, complete and DT-77F board, complete read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 117.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
401	* A-7062-329-A	CD-20P BOARD, COMPLETE (Note 1)	
402	A-7068-173-A	DT-77F HIC BOARD, COMPLETE (Note 1)	
403	1-634-435-11	FP-265 FLEXIBLE BOARD	
404	* X-3739-811-1	PLATE ASSY, SHIELD, CD	
405	* X-3744-702-1	CASE (MAIN) ASSY, SHIELD, C	
406	3-335-640-51	SCREW (M2X16)	
407	1-547-381-12	FILTER BLOCK, OPTICAL (OFB-02-03)	
408	* A-7030-188-A	CCD ASSY	
409	* 3-725-180-01	SHEET, INSULATING, CCD HOLDER	
410	* 3-744-771-01	FRAME (A), C	
411	* A-7071-214-A	FC-28P BOARD, COMPLETE	
412	X-3744-718-1	TRIPOD ASSY	
413	X-3749-013-1	COVER ASSY, GEAR	
414	3-718-233-01	NUT, PLATE	

Ref. No.	Part No.	Description	Remark
415	⚠· 1-466-230-21	CONVERTER UNIT, D/D	
416	* 3-744-765-01	FRAME (C), C	
417	* A-7062-666-A	VC-67P BOARD, COMPLETE	
418	A-7068-186-A	MX-10AP HIC BOARD, COMPLETE	
419	* 3-725-175-01	STOPPER, CCD	
420	3-746-217-01	SCREW, TAPPING(B), SPECIAL HEAD	
421	* A-7062-330-A	AF-54P BOARD, COMPLETE	
422	1-634-436-11	FP-266 FLEXIBLE BOARD	
423	3-738-519-11	SCREW (M2X3), +B	
424	3-727-903-11	SCREW (2X5), TAPPING, +B	
425	* 3-725-177-01	RUBBER, SEAL	
426	* X-3744-763-1	LID ASSY, C SHIELD CASE	
IC101	8-752-604-72	IC ICX039AN-2 (CCD IMAGER) (Note 1)	

5-10. ZOOM LENS ASSEMBLY (VCL-810XA)


451
not supplied
BT2P 2×4.5C
459
461
460
BT2P 2×4.5C
BT3P 2×6.5C
BT3P 1.7×4
463
462
BT2P 2×4.5C
#7
452
453
454
BT2P 2×4.5C
458
BT3P 2×4C
457
BT2P 2×5C
M2×3.5CM
456
BT3P 2×3.5C
BT3P 2×6.5C
BT2P 2×5C
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Ref. No.	Part No.	Description	Remark
451	1-547-421-11	LENS, ZOOM (VCL-810XA)	
452	3-707-926-01	RUBBER, FOCUS	
453	3-708-158-01	RING UNIT, F	
454	3-708-159-01	RING, (F) SCALE	
455	3-708-160-01	ZOOM UNIT	
456	3-708-161-01	BEARING, F	
457	3-708-162-01	HOLDER, PC BOARD	
458	3-708-173-01	SENSOR ASSY, (F)	
459	3-708-163-01	RING ASSY, ZOOM	
460	3-708-164-01	FRAME, MIDWAY	
461	3-708-165-01	BLOCK ASSY, REAR	
462	3-707-816-01	METER ASSY, EE	
463	3-708-169-01	IRIS UNIT	
464	3-707-817-01	MOTOR ASSY, AF GEAR	
465	3-707-818-01	MOTOR ASSY, PZ GEAR	
466	3-707-501-01	SCREW, (Z) MOTOR FITTING	

SECTION 6
ELECTRICAL PARTS LIST

AF-54P

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- CAPACITORS
  uF: μF
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: μH
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD....

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description	Remark
	* A-7062-330-A	AF-54P BOARD, COMPLETE ********************** (Ref.No 3,000 Series)	
		< CAPACITOR >	
C801	1-163-059-00	CERAMIC CHIP 0.01uF 10% 50V	
C802	1-163-059-00	CERAMIC CHIP 0.01uF 10% 50V	
C803	1-163-059-00	CERAMIC CHIP 0.01uF 10% 50V	
C804	1-164-634-11	CERAMIC CHIP 1uF 16V	
C805	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C806	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C807	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C808	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C810	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C811	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C812	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C813	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C814	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C815	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C816	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C817	1-164-634-11	CERAMIC CHIP 1uF 16V	
C818	1-164-634-11	CERAMIC CHIP 1uF 16V	
C819	1-135-091-00	TANTALUM CHIP 1uF 20% 16V	
C820	1-164-634-11	CERAMIC CHIP 1uF 16V	
C821	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C822	1-162-952-11	CERAMIC CHIP 82PF 5% 50V	
C823	1-162-954-11	CERAMIC CHIP 120PF 5% 50V	
C824	1-164-634-11	CERAMIC CHIP 1uF 16V	
C825	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C826	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C827	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C829	1-164-634-11	CERAMIC CHIP 1uF 16V	
C832	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C833	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C834	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C835	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C837	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C839	1-135-091-00	TANTALUM CHIP 1uF 20% 16V	
		< CONNECTOR >	
CN801	* 1-565-529-21	PIN, CONNECTOR (PC BOARD) 4P	
		< DIODE >	
D801	8-719-404-46	DIODE MA110	
		< FILTER >	
FL51	1-236-209-11	FILTER, LOW PASS	
FL851	1-236-209-11	FILTER, LOW PASS	
FL852	1-236-209-11	FILTER, LOW PASS	
FL852	1-236-209-11	FILTER, LOW PASS	
		< IC >	
IC801	8-752-334-68	IC CXD1205R	
IC802	8-759-148-87	IC CXA8016M	
IC803	8-752-334-49	IC CXD1172AM	
IC804	8-759-998-96	IC LM324D	
IC805	8-759-998-96	IC LM324D	
		< COIL >	
L801	1-410-655-31	INDUCTOR, CHIP 120uH	
		< TRANSISTOR >	
Q801	8-729-905-35	TRANSISTOR 2SC4081-R	
Q802	8-729-905-35	TRANSISTOR 2SC4081-R	
Q806	8-729-905-35	TRANSISTOR 2SC4081-R	
Q807	8-729-905-35	TRANSISTOR 2SC4081-R	
Q808	8-729-905-35	TRANSISTOR 2SC4081-R	
Q809	8-729-402-45	TRANSISTOR UN5212	

< RESISTOR >

Ref. No.	Part No.	Description			Remark
R801	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R802	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R803	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R804	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R805	1-216-821-11	METAL CHIP	1K	5%	1/16W
R806	1-216-821-11	METAL CHIP	1K	5%	1/16W
R807	1-216-821-11	METAL CHIP	1K	5%	1/16W
R808	1-216-821-11	METAL CHIP	1K	5%	1/16W
R809	1-216-134-00	METAL CHIP	2.2	5%	1/8W
R810	1-216-144-00	METAL CHIP	5.6	5%	1/8W
R811	1-216-833-11	METAL CHIP	10K	5%	1/16W
R816	1-216-864-11	METAL CHIP	0		
R819	1-216-833-11	METAL CHIP	10K	5%	1/16W
R820	1-216-833-11	METAL CHIP	10K	5%	1/16W
R821	1-216-833-11	METAL CHIP	10K	5%	1/16W
R822	1-216-821-11	METAL CHIP	1K	5%	1/16W
R823	1-216-821-11	METAL CHIP	1K	5%	1/16W
R827	1-216-833-11	METAL CHIP	10K	5%	1/16W
R828	1-216-833-11	METAL CHIP	10K	5%	1/16W
R829	1-216-833-11	METAL CHIP	10K	5%	1/16W
R830	1-216-833-11	METAL CHIP	10K	5%	1/16W
R831	1-216-833-11	METAL CHIP	10K	5%	1/16W
R832	1-216-833-11	METAL CHIP	10K	5%	1/16W
R833	1-216-821-11	METAL CHIP	1K	5%	1/16W
R834	1-216-821-11	METAL CHIP	1K	5%	1/16W
R835	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R836	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R837	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R838	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R839	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R840	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R841	1-216-833-11	METAL CHIP	10K	5%	1/16W
R842	1-216-837-11	METAL CHIP	22K	5%	1/16W
R843	1-216-844-11	METAL CHIP	82K	5%	1/16W
R844	1-216-819-11	METAL CHIP	680	5%	1/16W
R845	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R846	1-216-821-11	METAL CHIP	1K	5%	1/16W
R847	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R848	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R849	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R850	1-216-818-11	METAL CHIP	560	5%	1/16W
R851	1-216-857-11	METAL CHIP	1M	5%	1/16W
R852	1-216-857-11	METAL CHIP	1M	5%	1/16W
R853	1-216-857-11	METAL CHIP	1M	5%	1/16W
R854	1-216-857-11	METAL CHIP	1M	5%	1/16W
R858	1-216-833-11	METAL CHIP	10K	5%	1/16W
R860	1-216-821-11	METAL CHIP	1K	5%	1/16W
R862	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R863	1-216-833-11	METAL CHIP	10K	5%	1/16W
R865	1-216-821-11	METAL CHIP	1K	5%	1/16W
R866	1-216-821-11	METAL CHIP	1K	5%	1/16W
R867	1-216-635-11	METAL CHIP	220	0.5%	1/10W
R868	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W

< FLEXIBLE BOARD >

Ref. No.	Part No.	Description
W801	1-634-436-11	FP-266 FLEXIBLE BOARD

****

* A-7062-328-A AU-60P BOARD, COMPLETE
****

(Ref.No 6,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C401	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C402	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C403	1-128-013-11	ELECT CHIP	1uF	20%	50V
C404	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C405	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C406	1-126-209-11	ELECT CHIP	100uF	20%	4V
C407	1-126-209-11	ELECT CHIP	100uF	20%	4V
C408	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C409	1-128-013-11	ELECT CHIP	1uF	20%	50V
C410	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C411	1-128-013-11	ELECT CHIP	1uF	20%	50V
C412	1-128-013-11	ELECT CHIP	1uF	20%	50V
C413	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C414	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C415	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C416	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C417	1-128-013-11	ELECT CHIP	1uF	20%	50V
C418	1-128-013-11	ELECT CHIP	1uF	20%	50V
C419	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C420	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C421	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C422	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C423	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C424	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C425	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C426	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C427	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C428	1-164-299-11	CERAMIC CHIP	0.22uF	10%	25V
C429	1-126-603-11	ELECT CHIP	4.7uF	20%	35V
C430	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C431	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C432	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V

Ref. No.	Part No.	Description			Remark
C433	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C434	1-126-209-11	ELECT CHIP	100uF	20%	4V
C435	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C436	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C437	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C438	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C439	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C440	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C441	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C442	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C443	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C446	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C448	1-128-013-11	ELECT CHIP	1uF	20%	50V
C449	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C450	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C451	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C452	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C453	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C454	1-164-299-11	CERAMIC CHIP	0.22uF	10%	25V
C455	1-126-603-11	ELECT CHIP	4.7uF	20%	35V
C456	1-126-207-11	ELECT CHIP	33uF	20%	4V
C457	1-164-299-11	CERAMIC CHIP	0.22uF	10%	25V
C458	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C459	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C460	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C461	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C462	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C463	1-126-209-11	ELECT CHIP	100uF	20%	4V
C464	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C467	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C468	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C469	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C470	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C471	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C473	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C475	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C477	1-128-013-11	ELECT CHIP	1uF	20%	50V
C478	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C479	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C480	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C481	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C482	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C483	1-164-299-11	CERAMIC CHIP	0.22uF	10%	25V
C484	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C486	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C488	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C489	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C494	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V

Ref. No.	Part No.	Description			Remark
C495	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C496	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
		< CONNECTOR >			
CN401	1-565-879-11	PIN, CONNECTOR (PC BOARD) 7P			
		< DIODE >			
D401	8-719-404-46	DIODE MA110			
		< FILTER >			
FL401	1-236-837-21	FILTER, BAND PASS			
FL402	1-236-838-21	FILTER, BAND PASS			
		< IC >			
IC401	8-759-823-22	IC CXA-1536Q			
IC402	8-759-009-22	IC MC14094BF			
IC403	8-759-823-20	IC CXA-1488R			
IC404	8-759-823-20	IC CXA-1488R			
IC405	8-759-710-79	IC NJM2107F			
		< COIL >			
L401	1-410-381-11	INDUCTOR CHIP 10uH			
		< TRANSISTOR >			
Q401	8-729-904-07	TRANSISTOR FMG2			
Q402	8-729-905-18	TRANSISTOR DTC144EU			
Q403	8-729-904-07	TRANSISTOR FMG2			
Q404	8-729-904-07	TRANSISTOR FMG2			
Q405	8-729-905-18	TRANSISTOR DTC144EU			
Q407	8-729-905-18	TRANSISTOR DTC144EU			
Q408	8-729-907-26	TRANSISTOR IMX1			
Q409	8-729-905-35	TRANSISTOR 2SC4081-R			
Q410	8-729-907-26	TRANSISTOR IMX1			
Q411	8-729-907-26	TRANSISTOR IMX1			
Q412	8-729-905-18	TRANSISTOR DTC144EU			
Q413	8-729-905-35	TRANSISTOR 2SC4081-R			
Q414	8-729-905-12	TRANSISTOR DTA144EU			
Q415	8-729-905-18	TRANSISTOR DTC144EU			
Q416	8-729-905-12	TRANSISTOR DTA144EU			
Q417	8-729-905-18	TRANSISTOR DTC144EU			
Q418	8-729-905-18	TRANSISTOR DTC144EU			
Q420	8-729-924-46	TRANSISTOR DTC124XU			
Q421	8-729-905-12	TRANSISTOR DTA144EU			
Q422	8-729-922-94	TRANSISTOR DTC143TU			
Q423	8-729-922-94	TRANSISTOR DTC143TU			
Q424	8-729-905-18	TRANSISTOR DTC144EU			

Ref. No.	Part No.	Description				Remark
		< RESISTOR >				
R401	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R402	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R403	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R404	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R405	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R406	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R407	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R408	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R409	1-216-864-11	METAL CHIP	0			
R410	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R411	1-216-864-11	METAL CHIP	0			
R412	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R413	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R414	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R415	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R416	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R417	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R418	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R419	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R420	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R421	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R422	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R423	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R424	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R425	1-216-820-11	METAL CHIP	820	5%	1/16W	
R426	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R427	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R428	1-216-817-11	METAL CHIP	470	5%	1/16W	
R429	1-216-818-11	METAL CHIP	560	5%	1/16W	
R430	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R431	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R432	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R433	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R434	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R435	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R436	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R437	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R439	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R440	1-216-864-11	METAL CHIP	0			
R443	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R444	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R445	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R446	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W	
R447	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R448	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R449	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R450	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R451	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R452	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R453	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R454	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R455	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R456	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R458	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R460	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R461	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R462	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R463	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R464	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R466	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R467	1-216-864-11	METAL CHIP	0			
R468	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R471	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R472	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R473	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R474	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W	
R475	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R476	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R477	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R478	1-216-864-11	METAL CHIP	0			
R479	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R480	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R482	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R483	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R484	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R485	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R486	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R487	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R488	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R489	1-216-864-11	METAL CHIP	0			
R492	1-216-864-11	METAL CHIP	0			
R494	1-216-864-11	METAL CHIP	0			
R496	1-216-864-11	METAL CHIP	0			
R498	1-216-864-11	METAL CHIP	0			
R761	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R762	1-216-864-11	METAL CHIP	0			
R763	1-216-864-11	METAL CHIP	0			
R764	1-216-864-11	METAL CHIP	0			
R765	1-216-864-11	METAL CHIP	0			
R766	1-216-864-11	METAL CHIP	0			
R767	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R769	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R770	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R771	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R772	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R773	1-216-821-11	METAL CHIP	1K	5%	1/16W	

Ref. No.	Part No.	Description	Remark
		< VARIABLE RESISTOR >	
RV401	1-238-090-11	RES, ADJ CERMET 10K	
RV402	1-238-090-11	RES, ADJ CERMET 10K	
RV403	1-238-089-11	RES, ADJ CERMET 4.7K	
RV404	1-238-090-11	RES, ADJ CERMET 10K	
RV405	1-238-090-11	RES, ADJ CERMET 10K	
RV406	1-238-089-11	RES, ADJ CERMET 4.7K	
RV407	1-238-090-11	RES, ADJ CERMET 10K	
RV408	1-238-090-11	RES, ADJ CERMET 10K	
		< TERMINAL >	
TP401	* 1-535-622-11	PIN, TERMINAL	
TP402	* 1-535-622-11	PIN, TERMINAL	
		< FLEXIBLE BOARD >	
W401	1-634-432-11	FP-261 FLEXIBLE BOARD	

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* A-7062-665-A CC-33P BOARD, COMPLETE
****
(Ref.No 6,000 Series)

Ref. No.	Part No.	Description	Remark
		< CAPACITOR >	
C901	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C902	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C911	1-163-099-00	CERAMIC CHIP 18PF 5% 50V	
C912	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C913	1-163-099-00	CERAMIC CHIP 18PF 5% 50V	
C914	1-163-035-00	CERAMIC CHIP 0.047uF 50V	
C915	1-163-017-00	CERAMIC CHIP 0.0047uF 5% 50V	
C916	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C918	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C919	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C920	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C921	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C922	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C924	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C925	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C926	1-163-227-11	CERAMIC CHIP 10PF 5% 50V	
C927	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
C929	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C930	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C931	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C932	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C933	1-163-038-00	CERAMIC CHIP 0.1uF 25V	

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN901	1-566-529-11	CONNECTOR, FPC (ZIF) 13P	
CN902	1-566-527-11	CONNECTOR, FPC (ZIF) 11P	
		< DIODE >	
D912	8-719-404-46	DIODE MA110	
		< IC >	
IC910	8-759-502-14	IC CF79050PV	
IC911	8-752-010-20	IC CX20102	
		< COIL >	
L910	1-410-658-31	INDUCTOR, CHIP 220uH	
L912	1-410-381-11	INDUCTOR CHIP 10uH	
L913	1-410-381-11	INDUCTOR CHIP 10uH	
L914	1-410-381-11	INDUCTOR CHIP 10uH	
		< TRANSISTOR >	
Q901	8-729-902-93	TRANSISTOR FMG4	
Q912	8-729-901-01	TRANSISTOR DTC144EK	
Q913	8-729-100-66	TRANSISTOR 2SC1623	
Q914	8-729-100-66	TRANSISTOR 2SC1623	
Q915	8-729-100-66	TRANSISTOR 2SC1623	
Q916	8-729-100-66	TRANSISTOR 2SC1623	
		< RESISTOR >	
R901	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R902	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R905	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R906	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R910	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R916	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R917	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R918	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R922	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R924	1-216-295-00	METAL CHIP 0 5% 1/10W	
R926	1-216-295-00	METAL CHIP 0 5% 1/10W	
R927	1-216-295-00	METAL CHIP 0 5% 1/10W	
R928	1-216-295-00	METAL CHIP 0 5% 1/10W	
R929	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R930	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R931	1-216-645-11	METAL CHIP 560 0.5% 1/10W	
R932	1-216-045-00	METAL CHIP 680 5% 1/10W	
R933	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R934	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R935	1-216-109-00	METAL CHIP 330K 5% 1/10W	
R936	1-216-109-00	METAL CHIP 330K 5% 1/10W	

Ref. No.	Part No.	Description			Remark
R937	1-216-081-00	METAL CHIP	22K	5%	1/10W
R938	1-216-029-00	METAL CHIP	150	5%	1/10W
R939	1-216-041-00	METAL CHIP	470	5%	1/10W
R940	1-216-085-00	METAL CHIP	33K	5%	1/10W
R941	1-216-045-00	METAL CHIP	680	5%	1/10W
R942	1-216-049-00	METAL CHIP	1K	5%	1/10W
R943	1-216-045-00	METAL CHIP	680	5%	1/10W
R944	1-216-073-00	METAL CHIP	10K	5%	1/10W
R945	1-216-073-00	METAL CHIP	10K	5%	1/10W
R946	1-216-025-00	METAL CHIP	100	5%	1/10W
R948	1-216-073-00	METAL CHIP	10K	5%	1/10W
R949	1-216-295-00	METAL CHIP	0	5%	1/10W
R950	1-216-045-00	METAL CHIP	680	5%	1/10W
R951	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R953	1-216-049-00	METAL CHIP	1K	5%	1/10W
R954	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R955	1-216-029-00	METAL CHIP	150	5%	1/10W
R956	1-216-045-00	METAL CHIP	680	5%	1/10W
R957	1-216-001-00	METAL CHIP	10	5%	1/10W
R958	1-216-097-00	METAL CHIP	100K	5%	1/10W
R959	1-216-047-00	METAL CHIP	820	5%	1/10W
R960	1-216-049-00	METAL CHIP	1K	5%	1/10W
R962	1-216-295-00	METAL CHIP	0	5%	1/10W
R963	1-216-295-00	METAL CHIP	0	5%	1/10W
R964	1-216-295-00	METAL CHIP	0	5%	1/10W
R965	1-216-049-00	METAL CHIP	1K	5%	1/10W
R966	1-216-295-00	METAL CHIP	0	5%	1/10W
R967	1-216-049-00	METAL CHIP	1K	5%	1/10W
R968	1-216-295-00	METAL CHIP	0	5%	1/10W
R969	1-216-295-00	METAL CHIP	0	5%	1/10W
R970	1-216-295-00	METAL CHIP	0	5%	1/10W
R971	1-216-033-00	METAL CHIP	220	5%	1/10W
R972	1-216-033-00	METAL CHIP	220	5%	1/10W
R973	1-216-295-00	METAL CHIP	0	5%	1/10W
R974	1-216-295-00	METAL CHIP	0	5%	1/10W
R980	1-216-295-00	METAL CHIP	0	5%	1/10W
R981	1-216-295-00	METAL CHIP	0	5%	1/10W
R982	1-216-295-00	METAL CHIP	0	5%	1/10W
R986	1-216-025-00	METAL CHIP	100	5%	1/10W

< VARIABLE RESISTOR >

RV910	1-238-088-11	RES, ADJ, CERMET	2.2K

< FLEXIBLE BOARD >

W901	1-634-429-11	FP-258 FLEXIBLE BOARD

< CRYSTAL >

X910	1-577-553-21	VIBRATOR, CRYSTAL

* A-7062-329-A CD-20P BOARD, COMPLETE

****

(Ref. No 4,000 Series)

3-744-718-01 HOLDER (10), C

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C101	1-126-200-11	ELECT CHIP	10uF	20%	35V
C102	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C104	1-128-013-11	ELECT CHIP	1uF	20%	50V
C105	1-126-607-11	ELECT CHIP	47uF	20%	4V
C107	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C110	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C111	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C112	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C113	1-128-013-11	ELECT CHIP	1uF	20%	50V
C114	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C115	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C121	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C122	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C123	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C124	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C125	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C126	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C127	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C128	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C129	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C130	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C131	1-162-638-11	CERAMIC CHIP	1uF		16V
C135	1-162-638-11	CERAMIC CHIP	1uF		16V
C136	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C137	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C138	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C140	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C141	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C142	1-135-145-11	TANTALUM CHIP	0.47uF	10%	25V
C144	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C147	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C187	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C188	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C189	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C190	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C191	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C192	1-126-100-11	ELECT	10uF	20%	6.3V

< CONNECTOR >

CN101	* 1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P

Ref. No.	Part No.	Description	Remark
		< TRIMMER >	
CT121	1-141-424-11	CAP, ADJ	
CT122	1-141-356-11	CAP, ADJ	
		< DIODE >	
D101	8-719-404-46	DIODE MA110	
D102	8-719-404-52	DIODE MA143	
D122	8-719-404-46	DIODE MA110	
D123	8-719-404-46	DIODE MA110	
D124	8-719-404-32	DIODE MA141WA	
D125	8-719-949-46	DIODE 1T32	
D127	8-719-404-46	DIODE MA110	
D128	8-719-404-46	DIODE MA110	
		< HIC BOARD >	
HIC121	A-7068-173-A	DT-77F BOARD, COMPLETE (HIC)	
		< IC >	
IC121	8-752-326-08	IC CXD1159Q	
		< COIL >	
L101	1-412-063-21	INDUCTOR, CHIP 68uH	
L121	1-412-058-11	INDUCTOR, CHIP 10uH	
L122	1-412-058-11	INDUCTOR, CHIP 10uH	
L123	1-410-381-11	INDUCTOR, CHIP 10uH	
L182	1-412-058-11	INDUCTOR, CHIP 10uH	
L183	1-412-052-21	INDUCTOR, CHIP 1uH	
L184	1-412-058-11	INDUCTOR, CHIP 10uH	
		< TRANSISTOR >	
Q101	8-765-420-02	TRANSISTOR 2SK300-3	
Q102	8-729-905-35	TRANSISTOR 2SC4081-R	
Q121	8-729-402-84	TRANSISTOR XN4601	
Q122	8-729-402-78	TRANSISTOR XN6401	
Q123	8-729-402-19	TRANSISTOR XN6501	
Q125	8-729-905-35	TRANSISTOR 2SC4081-R	
Q126	8-729-402-84	TRANSISTOR XN4601	
Q127	8-729-402-84	TRANSISTOR XN4601	
Q129	8-729-905-23	TRANSISTOR 2SA1576-R	
Q130	8-729-905-35	TRANSISTOR 2SC4081-R	
Q131	8-729-402-84	TRANSISTOR XN4601	
Q132	8-729-402-84	TRANSISTOR XN4601	
Q133	8-729-402-84	TRANSISTOR XN4601	
Q135	8-729-402-84	TRANSISTOR XN4601	
Q136	8-729-402-45	TRANSISTOR UN5212	
Q137	8-729-402-84	TRANSISTOR XN4601	

Ref. No.	Part No.	Description	Remark
		< RESISTOR >	
R101	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R102	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R103	1-216-820-11	METAL CHIP 820 5% 1/16W	
R104	1-216-809-11	METAL CHIP 100 5% 1/16W	
R105	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R108	1-216-864-11	METAL CHIP 0	
R110	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R111	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R112	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R113	1-216-864-11	METAL CHIP 0	
R114	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R115	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R116	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R117	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R118	1-216-813-11	METAL CHIP 220 5% 1/16W	
R119	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R120	1-216-813-11	METAL CHIP 220 5% 1/16W	
R121	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R122	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R124	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R125	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R126	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R127	1-216-820-11	METAL CHIP 820 5% 1/16W	
R128	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R129	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R130	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R131	1-216-844-11	METAL CHIP 82K 5% 1/16W	
R132	1-216-844-11	METAL CHIP 82K 5% 1/16W	
R133	1-216-850-11	METAL CHIP 270K 5% 1/16W	
R136	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R138	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R139	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R140	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R141	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R142	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R143	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R144	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R145	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R148	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R149	1-216-864-11	METAL CHIP 0	
R154	1-216-864-11	METAL CHIP 0	
R155	1-216-864-11	METAL CHIP 0	
R156	1-216-809-11	METAL CHIP 100 5% 1/16W	
R157	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R158	1-216-862-11	METAL GLAZE 2.7M 5% 1/16W	
R159	1-216-809-11	METAL CHIP 100 5% 1/16W	
R160	1-216-833-11	METAL CHIP 10K 5% 1/16W	

Ref. No.	Part No.	Description			Remark
R162	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R163	1-216-845-11	METAL CHIP	100K	5%	1/16W
R164	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R165	1-216-837-11	METAL CHIP	22K	5%	1/16W
R166	1-216-836-11	METAL CHIP	18K	5%	1/16W
R167	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R168	1-216-821-11	METAL CHIP	1K	5%	1/16W
R169	1-216-864-11	METAL CHIP	0		
R171	1-216-821-11	METAL CHIP	1K	5%	1/16W
R172	1-216-813-11	METAL CHIP	220	5%	1/16W
R173	1-216-813-11	METAL CHIP	220	5%	1/16W
R181	1-216-821-11	METAL CHIP	1K	5%	1/16W
R182	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R183	1-216-821-11	METAL CHIP	1K	5%	1/16W
R184	1-216-835-11	METAL CHIP	15K	5%	1/16W
R185	1-216-821-11	METAL CHIP	1K	5%	1/16W
R186	1-216-821-11	METAL CHIP	1K	5%	1/16W
R187	1-216-821-11	METAL CHIP	1K	5%	1/16W
R188	1-216-821-11	METAL CHIP	1K	5%	1/16W
R189	1-216-821-11	METAL CHIP	1K	5%	1/16W
R190	1-216-821-11	METAL CHIP	1K	5%	1/16W
R191	1-216-821-11	METAL CHIP	1K	5%	1/16W
R192	1-216-821-11	METAL CHIP	1K	5%	1/16W
R193	1-216-821-11	METAL CHIP	1K	5%	1/16W
R194	1-216-821-11	METAL CHIP	1K	5%	1/16W
R195	1-216-821-11	METAL CHIP	1K	5%	1/16W
R196	1-216-813-11	METAL CHIP	220	5%	1/16W
R197	1-216-821-11	METAL CHIP	1K	5%	1/16W
R198	1-216-821-11	METAL CHIP	1K	5%	1/16W
R199	1-216-821-11	METAL CHIP	1K	5%	1/16W
R200	1-216-844-11	METAL CHIP	82K	5%	1/16W
R201	1-216-671-11	METAL CHIP	6.8K	0.5%	1/10W
R202	1-216-643-11	METAL CHIP	470	0.5%	1/10W
R203	1-216-681-11	METAL CHIP	18K	0.5%	1/10W
R204	1-216-671-11	METAL CHIP	6.8K	0.5%	1/10W
R205	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W
R206	1-216-681-11	METAL CHIP	18K	0.5%	1/10W
R207	1-216-841-11	METAL CHIP	47K	5%	1/16W
R208	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R209	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R210	1-216-833-11	METAL CHIP	10K	5%	1/16W
R215	1-216-842-11	METAL CHIP	56K	5%	1/16W
R216	1-216-833-11	METAL CHIP	10K	5%	1/16W
R217	1-216-833-11	METAL CHIP	10K	5%	1/16W
R218	1-216-833-11	METAL CHIP	10K	5%	1/16W
R219	1-216-833-11	METAL CHIP	10K	5%	1/16W
R220	1-216-835-11	METAL CHIP	15K	5%	1/16W
R221	1-216-840-11	METAL CHIP	39K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R222	1-216-833-11	METAL CHIP	10K	5%	1/16W
R226	1-216-864-11	METAL CHIP	0		
R229	1-216-864-11	METAL CHIP	0		
R230	1-216-833-11	METAL CHIP	10K	5%	1/16W
R233	1-216-841-11	METAL CHIP	47K	5%	1/16W
R234	1-216-841-11	METAL CHIP	47K	5%	1/16W
R235	1-216-833-11	METAL CHIP	10K	5%	1/16W
R236	1-216-833-11	METAL CHIP	10K	5%	1/16W

< FLEXIBLE BOARD >

W102	1-634-435-11	FP-265 FLEXIBLE BOARD

< CRYSTAL >

X121	1-579-076-11	VIBRATOR, CRYSTAL
X122	1-567-733-11	VIBRATOR, CRYSTAL

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* A-7071-214-A FC-28P BOARD, COMPLETE
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(Ref. No 7,000 Series)

< CONNECTOR >

CN601	1-566-532-11	CONNECTOR, FPC (ZIF) 16P
CN602	1-569-476-11	CONNECTOR, FPC (SMT TYPE ZIF) 12P
CN603	* 1-565-875-11	PIN, CONNECTOR (PC BOARD) 3P
CN604	* 1-566-764-11	PIN, CONNECTOR (PC BOARD) 9P

< DIODE >

D601	8-719-940-45	DIODE	DWA010

< RESISTOR >

R601	1-216-017-00	METAL CHIP	47	5%	1/10W

< SWITCH >

S601	1-571-787-41	SWITCH, TACTILE (REC START/STOP)
S602	1-571-787-11	SWITCH, TACTILE (COUNTER RESET)
S603	1-571-787-11	SWITCH, TACTILE (ZERO MEM)
S604	1-571-787-11	SWITCH, TACTILE (EDITSEARCH +)
S605	1-571-787-11	SWITCH, TACTILE (EDITSEARCH -)
S606	1-571-787-11	SWITCH, TACTILE (INDEX MARK)

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Ref. No.	Part No.	Description	Remark
	* A-7062-667-A	FD-15P BOARD, COMPLETE ********************** (Ref. No 5,000 Series)	
	* 3-744-736-01	HOLDER, TALLY	
	3-744-737-01	TERMINAL (A), L	
	3-744-738-01	TERMINAL (B), L	
	* 3-744-761-01	HOLDER, LCD	
	3-746-207-01	COVER, LITIUM	

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C201	1-162-917-11	CERAMIC CHIP 15PF 5% 50V	
C202	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C203	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
C204	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C205	1-162-971-11	CERAMIC CHIP 0.001uF 50V	
C206	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C207	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C208	1-162-961-11	CERAMIC CHIP 330PF 10% 50V	
C209	1-162-962-11	CERAMIC CHIP 470PF 10% 50V	
C210	1-135-216-11	TANTALUM CHIP 10uF 20% 10V	
C211	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C212	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C213	1-135-216-11	TANTALUM CHIP 10uF 20% 10V	
C214	1-162-971-11	CERAMIC CHIP 0.001uF 50V	
C215	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
C216	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C217	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
C218	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C221	1-162-920-11	CERAMIC CHIP 27PF 5% 50V	
C222	1-162-920-11	CERAMIC CHIP 27PF 5% 50V	
C223	1-135-215-21	TANTAL. CHIP 6.8uF 20% 16V	
C224	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C230	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C231	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C300	1-135-145-11	TANTALUM CHIP 0.47uF 10% 25V	
C301	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C302	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C303	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C304	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C309	1-135-145-11	TANTALUM CHIP 0.47uF 10% 25V	
C310	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C311	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C312	1-162-958-11	CERAMIC CHIP 270PF 5% 50V	
C313	1-162-919-11	CERAMIC CHIP 22PF 5% 50V	
C332	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C333	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C334	1-162-958-11	CERAMIC CHIP 270PF 5% 50V	
C335	1-162-915-11	CERAMIC CHIP 10PF 0.5PF 50V	
C336	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C337	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
C338	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C339	1-135-145-11	TANTALUM CHIP 0.47uF 10% 25V	
C340	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C341	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C342	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C343	1-162-917-11	CERAMIC CHIP 15PF 5% 50V	
C344	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C345	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C346	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C347	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C348	1-162-915-11	CERAMIC CHIP 10PF 0.5PF 50V	
C349	1-135-177-21	TANTALUM CHIP 1uF 20% 20V	
C350	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C351	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C352	1-135-177-21	TANTALUM CHIP 1uF 20% 20V	
C353	1-162-638-11	CERAMIC CHIP 1uF 16V	
C354	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C355	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C356	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C357	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C361	1-162-921-11	CERAMIC CHIP 33PF 5% 50V	
C370	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C371	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C372	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN201	1-569-035-11	CONNECTOR, FPC (ZIF) 30P	

< TRIMMER >

Ref. No.	Part No.	Description	Remark
CT201	1-141-424-11	CAP, ADJ	
CT301	1-141-424-11	CAP, ADJ	
CT302	1-141-424-11	CAP, ADJ	

< DIODE >

Ref. No.	Part No.	Description	Remark
D201	8-719-940-45	DIODE DWA010	
D202	8-719-404-46	DIODE MA110	
D203	8-719-938-72	DIODE SB01-05CP	
D204	8-719-420-36	DIODE MA151A	
D205	8-719-404-46	DIODE MA110	
D206	8-719-812-41	LED TLR124, RED	

< IC >

Ref. No.	Part No.	Description	Remark
IC201	8-759-152-41	IC uPD75316GF	
IC202	8-759-999-02	IC TL1596CDB	
IC203	8-759-145-63	IC uPD7564G-540	
IC205	8-759-937-54	IC S-81250HG-RD-S	
IC206	8-759-937-56	IC S-8054ALB-LM-S	

Ref. No.	Part No.	Description	Remark
IC301	8-759-998-30	IC CF79028PG	
IC302	8-752-336-66	IC CXK58257M-10L	
IC303	8-752-039-49	IC CXA1393AN	
IC304	8-759-634-47	IC M51285BGP	
		< COIL >	
L201	1-412-058-11	INDUCTOR CHIP 10uH	
L202	1-410-393-11	INDUCTOR CHIP 100uH	
L300	1-412-058-11	INDUCTOR CHIP 10uH	
L301	1-412-187-11	INDUCTOR 18uH	
L302	1-410-377-31	INDUCTOR CHIP 4.7uH	
L310	1-410-377-31	INDUCTOR CHIP 4.7uH	
L311	1-410-393-11	INDUCTOR CHIP 100uH	
		< DISPLAY PANEL >	
ND201	1-808-990-41	DISPLAY PANEL, LIQUID CRYSTAL	
		< TRANSISTOR >	
Q201	8-729-904-20	TRANSISTOR FMA2	
Q202	8-729-905-18	TRANSISTOR DTC144EU	
Q203	8-729-905-24	TRANSISTOR 2SA1576-S	
Q204	8-729-905-15	TRANSISTOR DTC144WU	
Q205	8-729-109-44	TRANSISTOR 2SK94	
Q206	8-729-402-78	TRANSISTOR XN6401	
Q207	8-729-402-19	TRANSISTOR XN6501	
Q208	8-729-402-78	TRANSISTOR XN6401	
Q209	8-729-403-10	TRANSISTOR XN6215	
Q210	8-729-905-XX	TRANSISTOR DTC114TU	
Q211	8-729-100-66	TRANSISTOR 2SC1623	
Q212	8-729-905-XX	TRANSISTOR DTC114TU	
Q213	8-729-905-18	TRANSISTOR DTC144EU	
Q214	8-729-905-12	TRANSISTOR DTA144EU	
Q301	8-729-925-91	TRANSISTOR DTC115EU	
Q311	8-729-905-35	TRANSISTOR 2SC4081-R	
Q312	8-729-905-35	TRANSISTOR 2SC4081-R	
Q313	8-729-905-18	TRANSISTOR DTC144EU	
Q314	8-729-905-35	TRANSISTOR 2SC4081-R	
Q316	8-729-905-12	TRANSISTOR DTA144EU	
Q317	8-729-905-24	TRANSISTOR 2SA1576-S	
		< RESISTOR >	
R201	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R202	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R203	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R204	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R207	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R208	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R209	1-216-833-11	METAL CHIP 10K 5% 1/16W	

Ref. No.	Part No.	Description	Remark
R210	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R218	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R219	1-216-864-11	METAL CHIP 0	
R220	1-216-819-11	METAL CHIP 680 5% 1/16W	
R221	1-216-809-11	METAL CHIP 100 5% 1/16W	
R222	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R223	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R224	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R225	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R242	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R244	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R245	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R246	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R247	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R248	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R249	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R250	1-216-596-11	METAL GLAZE 2.7K 1% 1/10W	
R251	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R252	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R253	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R254	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R255	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R256	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R257	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R258	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R266	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R267	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R269	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R270	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R271	1-216-861-11	METAL CHIP 2.2M 5% 1/16W	
R272	1-216-809-11	METAL CHIP 100 5% 1/16W	
R273	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R274	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R275	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R276	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R277	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R278	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R279	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R280	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R281	1-216-852-11	METAL CHIP 390K 5% 1/16W	
R282	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R283	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R284	1-216-855-11	METAL CHIP 680K 5% 1/16W	
R285	1-216-855-11	METAL CHIP 680K 5% 1/16W	
R286	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R287	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R288	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R289	1-216-841-11	METAL CHIP 47K 5% 1/16W	

Ref. No.	Part No.	Description	Remark
R290	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R295	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R296	1-216-814-11	METAL CHIP 270 5% 1/16W	
R297	1-216-814-11	METAL CHIP 270 5% 1/16W	
R300	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R304	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R306	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R309	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R311	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R313	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R320	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R321	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R322	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R324	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R331	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R332	1-216-814-11	METAL CHIP 270 5% 1/16W	
R333	1-216-806-11	METAL GLAZE 56 5% 1/16W	
R334	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R335	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R336	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R338	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R339	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R340	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R341	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R342	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R343	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R344	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R345	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R346	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R347	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R348	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R349	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R350	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R351	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R352	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R356	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R357	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R358	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R359	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R360	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R361	1-216-817-11	METAL CHIP 470 5% 1/16W	
R364	1-216-815-11	METAL CHIP 330 5% 1/16W	
R365	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R366	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	

< NETWORK RESISTOR >

Ref. No.	Part No.	Description	Remark
RB201	1-236-412-11	NETWORK, RES 1.0K	
RB202	1-236-424-11	NETWORK, RES 10K	
RB203	1-236-424-11	NETWORK, RES 10K	
RB204	1-236-424-11	NETWORK, RES 10K	
RB205	1-236-412-11	NETWORK, RES 1.0K	
RB207	1-236-432-11	NETWORK, RES 47K	
RB208	1-236-424-11	NETWORK, RES 10K	
RB209	1-236-436-11	NETWORK, RES 100K	
RB210	1-236-436-11	NETWORK, RES 100K	
RB211	1-236-412-11	NETWORK, RES 1.0K	
RB212	1-236-424-11	NETWORK, RES 10K	
RB213	1-236-424-11	NETWORK, RES 10K	
RB214	1-236-436-11	NETWORK, RES 100K	
RB215	1-236-436-11	NETWORK, RES 100K	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV301	1-238-089-11	RES, ADJ CERMET 4.7K	
RV302	1-238-092-11	RES, ADJ CERMET 47K	

< SWITCH >

Ref. No.	Part No.	Description	Remark
S201	1-571-684-11	SWITCH, TACTIL (IRIS)	
S202	1-571-684-11	SWITCH, TACTIL (TITLE 1)	
S203	1-571-684-11	SWITCH, TACTIL (TITLE 2)	
S204	1-571-684-11	SWITCH, TACTIL (MEMORY)	
S205	1-571-684-11	SWITCH, TACTIL (COLOR/MODE)	
S206	1-571-684-11	SWITCH, TACTIL (DATE (+))	
S207	1-571-684-11	SWITCH, TACTIL (TIME (NEXT))	
S208	1-571-684-11	SWITCH, TACTIL (PROGRAM AM)	
S209	1-571-684-11	SWITCH, TACTIL (WHT BAL)	
S210	1-572-319-11	SWITCH, ROTARY (CONTROL)	
S211	1-571-684-11	SWITCH, TACTIL (GAIN)	
S212	1-571-684-11	SWITCH, TACTIL (FOCUS)	
S213	1-571-684-11	SWITCH, TACTIL (ONE PUSH)	
S215	1-571-684-11	SWITCH, TACTIL (SHUTTER SPEED)	
S216	1-571-684-11	SWITCH, TACTIL (📥)	
S217	1-572-285-11	SWITCH, SLIDE (AUTO LOCK)	
S218	1-571-684-11	SWITCH, TACTIL (FADER)	

< THERMISTOR >

Ref. No.	Part No.	Description	Remark
TH300	1-800-200-00	THERMISTOR S-3K	

< TERMINAL >

Ref. No.	Part No.	Description	Remark
TP201	* 1-535-622-11	PIN, TERMINAL	
TP202	* 1-535-622-11	PIN, TERMINAL	

< CRYSTAL >

Ref. No.	Part No.	Description	Remark
X201	1-527-997-21	VIBRATOR, CRYSTAL	
X202	1-578-713-21	VIBLATOR, CERAMIC	
X203	1-577-163-21	VIBLATOR, CERAMIC	
X301	1-567-733-11	VIBRATOR, CRYSTAL	

FK-46 FU-71P

Ref. No.	Part No.	Description	Remark
	* 1-635-932-11	FK-46 BOARD (Ref.No 3,000 Series)	
		***********	
	1-634-434-11	FP-263 FLEXIBLE BOARD	
		< DIODE >	
D501	8-719-940-45	DIODE DWA010	
		< SWITCH >	
S101	1-572-284-11	SWITCH, SLIDE (EJECT)	
S501	1-571-787-11	SWITCH, TACTILE (MENU)	
S502	1-571-787-11	SWITCH, TACTILE (SLOW)	
S503	1-571-787-11	SWITCH, TACTILE (▷)	
S504	1-571-787-11	SWITCH, TACTILE (>)	
S505	1-571-787-11	SWITCH, TACTILE (<)	
S506	1-571-787-11	SWITCH, TACTILE (PAUSE)	
S507	1-571-787-11	SWITCH, TACTILE (EXCUTE)	
S508	1-572-284-11	SWITCH, SLIDE (REC)	
S509	1-572-283-11	SWITCH, SLIDE (POWER)	
S510	1-571-787-11	SWITCH, TACTILE (STOP)	
S511	1-571-787-11	SWITCH, TACTILE (▶)	
S512	1-571-787-11	SWITCH, TACTILE (DATA SCREEN)	
S513	1-571-787-11	SWITCH, TACTILE (FF)	
S514	1-571-787-11	SWITCH, TACTILE (◀)	
S515	1-571-787-11	SWITCH, TACTILE (▼)	
S516	1-571-787-11	SWITCH, TACTILE (REW)	

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Ref. No.	Part No.	Description	Remark
	* A-7062-663-A	FU-71P BOARD, COMPLETE	
		**********************	
		(Ref.No 3,000 Series)	
		< CAPACITOR >	
C101	1-124-604-00	ELECT 330uF 20% 10V	
C103	1-128-078-11	ELECT 33uF 20% 10V	
C104	1-124-584-00	ELECT 100uF 20% 10V	
C105	1-124-584-00	ELECT 100uF 20% 10V	
C106	1-127-561-11	ELECT(SOLID) 33uF 20% 10V	
C107	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C108	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C109	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C110	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C111	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C112	1-164-161-11	CERAMIC CHIP 0.0022uF 10% 100V	
C113	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C114	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C115	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C116	1-164-161-11	CERAMIC CHIP 0.0022uF 10% 100V	
C117	1-163-005-11	CERAMIC CHIP 470PF 10% 50V	
C118	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C119	1-163-119-00	CERAMIC CHIP 120PF 5% 50V	
C120	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C121	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C122	1-127-561-11	ELECT(SOLID) 33uF 20% 10V	
C124	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C125	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C126	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C127	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
		< CONNECTOR >	
CN101	1-566-757-11	PIN, CONNECTOR (PC BOARD) 2P	
CN102	1-569-557-11	CONNECTOR, BOARD TO BOARD 20P	
		< DIODE >	
D101	8-719-981-59	DIODE FC805	
D102	8-719-981-56	DIODE SB05W05CP	
D103	8-719-922-21	DIODE AR2222S	
		< IC >	
IC101	8-759-035-98	IC MC141600FU	
		< JACK >	
J101	1-537-241-11	TERMINAL BOARD (BATTERY)	
		< COIL >	
L101	1-410-337-11	INDUCTOR 1uH	
L102	1-410-337-11	INDUCTOR 1uH	
L103	1-410-337-11	INDUCTOR 1uH	
L104	1-424-104-11	COIL, CHOKE 10uH	
L105	1-424-104-11	COIL, CHOKE 10uH	
L106	1-424-106-11	COIL, CHOKE 47uH	
L107	1-424-105-11	COIL, CHOKE 22uH	
L108	1-424-106-11	COIL, CHOKE 47uH	
L110	1-412-029-11	INDUCTOR CHIP 10uH	
L111	1-412-029-11	INDUCTOR CHIP 10uH	
L112	1-412-029-11	INDUCTOR CHIP 10uH	
L113	1-412-027-11	INDUCTOR CHIP 2.2uH	
		< IC LINK >	
PS101 ⚠·	1-532-840-21	LINK, IC 1.25A	
PS102 ⚠·	1-532-841-21	LINK, IC 1.6A	
PS103 ⚠·	1-532-840-21	LINK, IC 1.25A	
		< TRANSISTOR >	
Q101	8-729-805-25	TRANSISTOR 2SB1121	
Q102	8-729-822-60	TRANSISTOR 2SB1302-S	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
Q103	8-729-805-25	TRANSISTOR 2SB1121	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R101	1-216-085-00	METAL CHIP 33K 5%	1/10W
R102	1-216-093-00	METAL CHIP 68K 5%	1/10W
R103	1-216-081-00	METAL CHIP 22K 5%	1/10W
R104	1-216-033-00	METAL CHIP 220 5%	1/10W
R105	1-216-081-00	METAL CHIP 22K 5%	1/10W
R106	1-216-077-00	METAL CHIP 15K 5%	1/10W
R107	1-216-033-00	METAL CHIP 220 5%	1/10W
R108	1-216-081-00	METAL CHIP 22K 5%	1/10W
R109	1-216-033-00	METAL CHIP 220 5%	1/10W
R110	1-216-089-00	METAL CHIP 47K 5%	1/10W
R111	1-216-089-00	METAL CHIP 47K 5%	1/10W
R112	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R113	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R114	1-216-073-00	METAL CHIP 10K 5%	1/10W
R115	1-216-081-00	METAL CHIP 22K 5%	1/10W
R116	1-216-081-00	METAL CHIP 22K 5%	1/10W
R117	1-216-089-00	METAL CHIP 47K 5%	1/10W
R118	1-216-093-00	METAL CHIP 68K 5%	1/10W
R119	1-216-041-00	METAL CHIP 470 5%	1/10W

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV101	1-238-088-11	RES, ADJ CERMET 2.2K	
RV102	1-238-092-11	RES, ADJ CERMET 47K	

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A-7062-089-A MC-43P BOARD, COMPLETE

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(Ref.No 6,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C801	1-163-019-00	CERAMIC CHIP 0.0068uF 10%	50V
C802	1-162-587-11	CERAMIC CHIP 0.039uF 10%	25V
C803	1-163-809-11	CERAMIC CHIP 0.047uF 10%	25V
C804	1-162-953-11	CERAMIC CHIP 100PF 5%	50V
C805	1-162-953-11	CERAMIC CHIP 100PF 5%	50V
C806	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C807	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C808	1-162-964-11	CERAMIC CHIP 0.001uF 10%	50V
C809	1-163-019-00	CERAMIC CHIP 0.0068uF 10%	50V
C810	1-162-587-11	CERAMIC CHIP 0.039uF 10%	25V
C811	1-163-809-11	CERAMIC CHIP 0.047uF 10%	25V
C812	1-162-953-11	CERAMIC CHIP 100PF 5%	50V
C813	1-162-953-11	CERAMIC CHIP 100PF 5%	50V
C814	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C815	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C816	1-162-964-11	CERAMIC CHIP 0.001uF 10%	50V
C817	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C820	1-135-177-21	TANTALUM CHIP 1uF 20%	20V
C821	1-162-941-11	CERAMIC CHIP 10PF 0.5PF	50V
C822	1-164-633-11	CERAMIC CHIP 0.1uF 10%	25V
C823	1-135-177-21	TANTALUM CHIP 1uF 20%	20V
C824	1-162-941-11	CERAMIC CHIP 10PF 0.5PF	50V
C825	1-164-633-11	CERAMIC CHIP 0.1uF 10%	25V
C826	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C827	1-126-206-11	ELECT CHIP 100uF 20%	6.3V
C828	1-162-953-11	CERAMIC CHIP 100PF 5%	50V
C829	1-162-953-11	CERAMIC CHIP 100PF 5%	50V
C830	1-126-205-11	ELECT CHIP 47uF 20%	6.3V
C834	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C835	1-162-953-11	CERAMIC CHIP 100PF 5%	50V
C836	1-162-953-11	CERAMIC CHIP 100PF 5%	50V
C838	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C839	1-162-970-11	CERAMIC CHIP 0.01uF 10%	25V
C840	1-162-968-11	CERAMIC CHIP 0.0047uF 10%	50V
C841	1-162-968-11	CERAMIC CHIP 0.0047uF 10%	50V
C842	1-162-953-11	CERAMIC CHIP 100PF 5%	50V
C843	1-162-953-11	CERAMIC CHIP 100PF 5%	50V
C844	1-162-964-11	CERAMIC CHIP 0.001uF 10%	50V
C845	1-162-964-11	CERAMIC CHIP 0.001uF 10%	50V

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN802	1-568-364-21	CONNECTOR, BOARD TO BOARD 12P	

< IC >

Ref. No.	Part No.	Description	Remark
IC801	8-759-111-56	IC uPC4572G2	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q801	8-729-109-44	TRANSISTOR 2SK94	
Q802	8-729-905-35	TRANSISTOR 2SC4081-R	
Q803	8-729-905-12	TRANSISTOR DTA144EU	
Q805	8-729-905-35	TRANSISTOR 2SC4081-R	
Q806	8-729-109-44	TRANSISTOR 2SK94	
Q807	8-729-905-35	TRANSISTOR 2SC4081-R	
Q808	8-729-905-12	TRANSISTOR DTA144EU	
Q810	8-729-905-35	TRANSISTOR 2SC4081-R	
Q811	8-729-905-12	TRANSISTOR DTA144EU	
Q812	8-729-905-35	TRANSISTOR 2SC4081-R	
Q813	8-729-904-07	TRANSISTOR FMG2	
Q815	8-729-905-35	TRANSISTOR 2SC4081-R	
Q816	8-729-905-23	TRANSISTOR 2SA1576-R	
Q817	8-729-905-35	TRANSISTOR 2SC4081-R	

< RESISTOR >

Ref. No.	Part No.	Description			Remark
R802	1-216-833-11	METAL CHIP	10K	5%	1/16W
R803	1-216-857-11	METAL CHIP	1M	5%	1/16W
R804	1-216-844-11	METAL CHIP	82K	5%	1/16W
R805	1-216-849-11	METAL CHIP	220K	5%	1/16W
R806	1-216-835-11	METAL CHIP	15K	5%	1/16W
R807	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R808	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R810	1-216-833-11	METAL CHIP	10K	5%	1/16W
R811	1-216-857-11	METAL CHIP	1M	5%	1/16W
R812	1-216-844-11	METAL CHIP	82K	5%	1/16W
R813	1-216-849-11	METAL CHIP	220K	5%	1/16W
R814	1-216-835-11	METAL CHIP	15K	5%	1/16W
R815	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R816	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R817	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R818	1-216-837-11	METAL CHIP	22K	5%	1/16W
R819	1-216-833-11	METAL CHIP	10K	5%	1/16W
R820	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R821	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R822	1-216-846-11	METAL CHIP	120K	5%	1/16W
R823	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R824	1-216-839-11	METAL CHIP	33K	5%	1/16W
R825	1-216-843-11	METAL CHIP	68K	5%	1/16W
R826	1-216-846-11	METAL CHIP	120K	5%	1/16W
R827	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R828	1-216-839-11	METAL CHIP	33K	5%	1/16W
R829	1-216-843-11	METAL CHIP	68K	5%	1/16W
R830	1-216-837-11	METAL CHIP	22K	5%	1/16W
R831	1-216-842-11	METAL CHIP	56K	5%	1/16W
R832	1-216-845-11	METAL CHIP	100K	5%	1/16W
R833	1-216-842-11	METAL CHIP	56K	5%	1/16W
R834	1-216-845-11	METAL CHIP	100K	5%	1/16W
R835	1-216-841-11	METAL CHIP	47K	5%	1/16W
R837	1-216-821-11	METAL CHIP	1K	5%	1/16W
R838	1-216-836-11	METAL CHIP	18K	5%	1/16W
R839	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R840	1-216-306-11	METAL CHIP	3.9	5%	1/10W
R841	1-216-810-11	METAL CHIP	120	5%	1/16W
R842	1-216-810-11	METAL CHIP	120	5%	1/16W

< SWITCH >

Ref. No.	Part No.	Description	Remark
SW801	1-570-870-11	SWITCH, SLIDE (BUILT IN MIC)	

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* A-7071-215-A MJ-40P BOARD, COMPLETE

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(Ref. No 6,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C751	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C752	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C753	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C754	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C755	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C756	1-162-953-11	CERAMIC CHIP	100PF	5%	50V

< CONNECTOR >

Ref. No.	Part No.	Description
CN751	1-568-332-51	CONNECTOR, BOARD TO BOARD 12P
CN752	* 1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P

< JACK >

Ref. No.	Part No.	Description
J751	1-507-899-00	JACK (SMALL TYPE) (MIC PLUG IN POWER)
J752	1-563-454-11	JACK, MINIATURE (DC OUT)

< COIL >

Ref. No.	Part No.	Description	
L751	1-410-369-11	INDUCTOR CHIP	1uH
L752	1-410-369-11	INDUCTOR CHIP	1uH
L753	1-410-369-11	INDUCTOR CHIP	1uH
L754	1-410-369-11	INDUCTOR CHIP	1uH
L755	1-410-369-11	INDUCTOR CHIP	1uH

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* A-7062-664-A SS-133 BOARD, COMPLETE

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(Ref. No 2,000 Series)

Ref. No.	Part No.	Description
	* 1-535-622-11	PIN, TERMINAL
	* 3-744-790-01	LID, REAR, RP SHIELD
	* 3-941-127-01	CASE (2), RP SHIELD
	8-741-100-63	IC SBX1619-51

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C001	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C002	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C003	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C004	1-126-602-11	ELECT CHIP	3.3uF	20%	50V
C005	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C006	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C010	1-124-242-00	ELECT	33uF	20%	25V
C011	1-126-163-11	ELECT	4.7uF	20%	50V
C012	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C013	1-163-035-00	CERAMIC CHIP	0.047uF		50V

Ref. No.	Part No.	Description			Remark
C014	1-164-004-11	CERAMIC CHIP	0. 1uF	10%	25V
C015	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C016	1-162-969-11	CERAMIC CHIP	0. 0068uF	10%	25V
C018	1-136-718-11	FILM, CHIP	0. 1uF	5%	25V
C019	1-164-004-11	CERAMIC CHIP	0. 1uF	10%	25V
C020	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C021	1-162-967-11	CERAMIC CHIP	0. 0033uF	10%	50V
C022	1-162-967-11	CERAMIC CHIP	0. 0033uF	10%	50V
C023	1-162-967-11	CERAMIC CHIP	0. 0033uF	10%	50V
C025	1-128-006-11	ELECT CHIP	4. 7uF	20%	25V
C026	1-164-330-21	CERAMIC CHIP	0. 22uF	10%	16V
C027	1-164-330-21	CERAMIC CHIP	0. 22uF	10%	16V
C028	1-135-216-11	TANTALUM CHIP	10uF	20%	10V
C030	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C031	1-135-216-11	TANTALUM CHIP	10uF	20%	10V
C032	1-164-004-11	CERAMIC CHIP	0. 1uF	10%	25V
C033	1-164-232-11	CERAMIC CHIP	0. 01uF		50V
C034	1-164-004-11	CERAMIC CHIP	0. 1uF	10%	25V
C035	1-164-004-11	CERAMIC CHIP	0. 1uF	10%	25V
C036	1-164-004-11	CERAMIC CHIP	0. 1uF	10%	25V
C037	1-162-638-11	CERAMIC CHIP	1uF		16V
C038	1-135-159-21	TANTALUM CHIP	10uF	10%	16V
C039	1-163-035-00	CERAMIC CHIP	0. 047uF		50V
C040	1-163-035-00	CERAMIC CHIP	0. 047uF		50V
C041	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C044	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C045	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C046	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C048	1-128-004-11	ELECT CHIP	10uF	20%	16V
C049	1-163-019-00	CERAMIC CHIP	0. 0068uF	10%	50V
C101	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C103	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C105	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C106	1-124-779-00	ELECT CHIP	10uF	20%	16v
C110	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C111	1-163-035-00	CERAMIC CHIP	0. 047uF		50V
C112	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C113	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C114	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C115	1-162-997-11	CERAMIC CHIP	10PF	0. 5PF	50V
C116	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C118	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C119	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C120	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C121	1-164-299-11	CERAMIC CHIP	0. 22uF	10%	25V
C122	1-124-257-00	ELECT	2. 2uF	20%	50V
C123	1-124-257-00	ELECT	2. 2uF	20%	50V
C124	1-163-037-11	CERAMIC CHIP	0. 022uF	10%	25V
C125	1-163-035-00	CERAMIC CHIP	0. 047uF		50V

Ref. No.	Part No.	Description			Remark
C150	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C151	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C152	1-128-004-11	ELECT CHIP	10uF	20%	16V
C153	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C154	1-128-006-11	ELECT CHIP	4. 7uF	20%	25V
C155	1-164-634-11	CERAMIC CHIP	1uF		16V
C156	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C157	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C158	1-163-037-11	CERAMIC CHIP	0. 022uF	10%	25V
C159	1-163-037-11	CERAMIC CHIP	0. 022uF	10%	25V
C160	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C161	1-162-968-11	CERAMIC CHIP	0. 0047uF	10%	50V
C162	1-162-967-11	CERAMIC CHIP	0. 0033uF	10%	50V
C163	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C165	1-164-004-11	CERAMIC CHIP	0. 1uF	10%	25V
C166	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C167	1-162-638-11	CERAMIC CHIP	1uF		16V
C168	1-162-638-11	CERAMIC CHIP	1uF		16V
C169	1-163-035-00	CERAMIC CHIP	0. 047uF		50V
C170	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C171	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C172	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C173	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C175	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V
C176	1-162-965-11	CERAMIC CHIP	0. 0015uF	10%	50V
C177	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C178	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C179	1-135-180-21	TANTALUM CHIP	3. 3uF	20%	6.3V
C180	1-164-634-11	CERAMIC CHIP	1uF		16V
C183	1-128-004-11	ELECT CHIP	10uF	20%	16V
C201	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C205	1-164-361-11	CERAMIC CHIP	0. 047uF		16V
C208	1-164-361-11	CERAMIC CHIP	0. 047uF		16V
C209	1-164-361-11	CERAMIC CHIP	0. 047uF		16V
C210	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C211	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C212	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C213	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C214	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C215	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C216	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C218	1-162-968-11	CERAMIC CHIP	0. 0047uF	10%	50V
C219	1-162-940-11	CERAMIC CHIP	9PF	0. 5PF	50V
C220	1-163-035-00	CERAMIC CHIP	0. 047uF		50V
C222	1-162-938-11	CERAMIC CHIP	7PF	0. 5PF	50V
C224	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C225	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C226	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C227	1-162-953-11	CERAMIC CHIP	100PF	5%	50V

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Ref. No.	Part No.	Description			Remark
C228	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C229	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V
C230	1-128-004-11	ELECT CHIP	10uF	20%	16V
C231	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C232	1-163-035-00	CERAMIC CHIP	0. 047uF		50V
C233	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C234	1-162-965-11	CERAMIC CHIP	0. 0015uF	10%	50V
C235	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C236	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C237	1-163-035-00	CERAMIC CHIP	0. 047uF		50V
C238	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C240	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C241	1-163-035-00	CERAMIC CHIP	0. 047uF		50V
C242	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C243	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C244	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C245	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C246	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C255	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C256	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C257	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C258	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C261	1-162-938-11	CERAMIC CHIP	7PF	0. 5PF	50V
C262	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C263	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C264	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C265	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C266	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C267	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C268	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C269	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C270	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C271	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C272	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C273	1-128-004-11	ELECT CHIP	10uF	20%	16V
C274	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C275	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C276	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C277	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C278	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C279	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C280	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C281	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C282	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C283	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C284	1-162-936-11	CERAMIC CHIP	5PF	0. 25PF	50V
C285	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C286	1-162-974-11	CERAMIC CHIP	0. 01uF		50V

Ref. No.	Part No.	Description			Remark
C287	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C288	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C289	1-128-004-11	ELECT CHIP	10uF	20%	16V
C290	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C291	1-128-004-11	ELECT CHIP	10uF	20%	16V
C292	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V
C293	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C294	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C295	1-163-035-00	CERAMIC CHIP	0. 047uF		50V
C296	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C297	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C298	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C299	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C300	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C301	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C302	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C303	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C304	1-128-004-11	ELECT CHIP	10uF	20%	16V
C305	1-162-966-11	CERAMIC CHIP	0. 0022uF	10%	50V
C308	1-128-011-11	ELECT CHIP	0. 33uF	20%	50V
C309	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C310	1-162-965-11	CERAMIC CHIP	0. 0015uF	10%	50V
C317	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C318	1-128-004-11	ELECT CHIP	10uF	20%	16V
C319	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V
C320	1-128-004-11	ELECT CHIP	10uF	20%	16V
C321	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C322	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C323	1-128-008-11	ELECT CHIP	3. 3uF	20%	35V
C324	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C325	1-124-778-00	ELECT CHIP	22uF	20%	6. 3V
C326	1-126-157-11	ELECT	10uF	20%	16V
C327	1-126-154-11	ELECT	47uF	20%	6. 3V
C328	1-135-202-21	TANTAL. CHIP	22uF	20%	4V
C329	1-164-361-11	CERAMIC CHIP	0. 047uF		16V
C330	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C331	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V
C332	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C333	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C334	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C335	1-126-205-11	ELECT CHIP	47uF	20%	6. 3V
C336	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C337	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C338	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C340	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C341	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C342	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V
C343	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V
C344	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V

Ref. No.	Part No.	Description	Remark
C345	1-163-809-11	CERAMIC CHIP 0.047uF 10%	25V
C346	1-163-809-11	CERAMIC CHIP 0.047uF 10%	25V
C347	1-162-943-11	CERAMIC CHIP 15PF 5%	50V
C349	1-162-936-11	CERAMIC CHIP 5PF 0.25PF	50V
		< CONNECTOR >	
CN003	1-569-558-11	CONNECTOR, BOARD TO BOARD 20P	
CN004	1-565-878-11	PIN, CONNECTOR (PC BOARD) 6P	
CN007	1-568-366-41	CONNECTOR, BOARD TO BOARD 16P	
CN009	1-568-367-41	CONNECTOR, BOARD TO BOARD 18P	
CN200	* 1-566-184-11	PIN, CONNECTOR (PC BOARD) 5P	
		< TRIMMER >	
CT101	1-141-424-11	CAP, ADJ	
CT102	1-141-424-11	CAP, ADJ	
		< DIODE >	
D001	8-719-941-86	DIODE DAN202U	
D002	8-719-404-46	DIODE MA110	
D003	8-719-404-46	DIODE MA110	
D004	8-719-941-86	DIODE DAN202U	
D101	8-719-949-46	DIODE 1T32	
D102	8-719-404-46	DIODE MA110	
D104	8-719-941-86	DIODE DAN202U	
D201	8-719-801-41	DIODE 1SS196	
D202	8-719-941-86	DIODE DAN202U	
D203	8-719-941-86	DIODE DAN202U	
D205	8-719-941-86	DIODE DAN202U	
D208	8-719-941-86	DIODE DAN202U	
D210	8-719-941-86	DIODE DAN202U	
D211	8-719-941-86	DIODE DAN202U	
		< HIC BOARD >	
HIC201	A-7068-183-A	HR-10 BOARD, COMPLETE (HIC)	
		< IC >	
IC001	8-752-817-79	IC CXP80116-828Q	
IC003	8-759-998-98	IC LM358D	
IC004	8-759-148-05	IC CXA8010M	
IC005	8-759-805-06	IC CXA1127M	
IC006	8-759-990-55	IC CXA8006M	
IC007	8-759-008-95	IC MC14028BF	
IC008	8-759-748-72	IC BR93C46F	
IC101	8-759-970-80	IC MB673198U	
IC102	8-759-148-62	IC uPD6451GT-630	
IC103	8-759-420-01	IC AN2512S	
IC104	8-759-234-20	IC TC7S08F	
IC150	8-752-035-48	IC CXA1204Q	
IC201	8-759-012-00	IC MC10H116M	

Ref. No.	Part No.	Description	Remark
IC202	8-759-998-92	IC LM393D	
IC204	8-759-998-32	IC CXD2107	
		< COIL >	
L001	1-412-058-11	INDUCTOR CHIP 10uH	
L101	1-410-388-21	INDUCTOR CHIP 39uH	
L102	1-410-393-11	INDUCTOR CHIP 100uH	
L103	1-408-797-11	INDUCTOR CHIP 470uH	
L150	1-412-058-11	INDUCTOR CHIP 10uH	
L151	1-408-795-21	INDUCTOR CHIP 330uH	
L152	1-412-058-11	INDUCTOR CHIP 10uH	
L201	1-412-058-11	INDUCTOR CHIP 10uH	
L202	1-412-058-11	INDUCTOR CHIP 10uH	
L203	1-410-732-31	INDUCTOR CHIP 0.18uH	
L205	1-410-384-31	INDUCTOR CHIP 18uH	
L206	1-410-384-31	INDUCTOR CHIP 18uH	
L207	1-410-381-11	INDUCTOR CHIP 10uH	
L208	1-408-793-21	INDUCTOR CHIP 220uH	
L209	1-408-795-21	INDUCTOR CHIP 330uH	
L210	1-410-167-41	INDUCTOR CHIP 820uH	
L211	1-410-387-11	INDUCTOR CHIP 33uH	
L212	1-410-657-21	INDUCTOR CHIP 180uH	
L214	1-410-387-11	INDUCTOR CHIP 33uH	
L215	1-410-374-11	INDUCTOR CHIP 2.7uH	
L216	1-410-381-11	INDUCTOR CHIP 10uH	
L217	1-410-380-31	INDUCTOR CHIP 8.2uH	
L218	1-410-379-21	INDUCTOR CHIP 6.8uH	
L221	1-408-791-00	INDUCTOR CHIP 150uH	
L222	1-408-795-21	INDUCTOR CHIP 330uH	
L224	1-410-380-31	INDUCTOR CHIP 8.2uH	
L225	1-412-058-11	INDUCTOR CHIP 10uH	
L226	1-410-380-31	INDUCTOR CHIP 8.2uH	
L227	1-412-058-11	INDUCTOR CHIP 10uH	
L228	1-410-382-31	INDUCTOR CHIP 12uH	
L229	1-410-382-31	INDUCTOR CHIP 12uH	
L230	1-410-657-21	INDUCTOR CHIP 180uH	
L231	1-412-058-11	INDUCTOR CHIP 10uH	
L232	1-410-386-11	INDUCTOR CHIP 27uH	
L233	1-410-381-11	INDUCTOR CHIP 10uH	
L234	1-410-381-11	INDUCTOR CHIP 10uH	
L235	1-412-058-11	INDUCTOR CHIP 10uH	
L236	1-412-058-11	INDUCTOR CHIP 10uH	
		< IC LINK >	
PS101 ⚠·	1-532-605-00	LINK, IC 0.4A (ICP-N10)	
		< TRANSISTOR >	
Q001	8-729-907-00	TRANSISTOR DTC114EU	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

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Ref. No.	Part No.	Description		Remark
Q002	8-729-905-12	TRANSISTOR	DTA144EU	
Q003	8-729-905-18	TRANSISTOR	DTC144EU	
Q004	8-729-820-47	TRANSISTOR	2SB1202FAT	
Q005	8-729-905-35	TRANSISTOR	2SC4081-R	
Q007	8-729-905-35	TRANSISTOR	2SC4081-R	
Q008	8-729-905-35	TRANSISTOR	2SC4081-R	
Q009	8-729-905-35	TRANSISTOR	2SC4081-R	
Q010	8-729-907-03	TRANSISTOR	FMG5	
Q011	8-729-905-18	TRANSISTOR	DTC144EU	
Q012	8-729-905-18	TRANSISTOR	DTC144EU	
Q013	8-729-905-18	TRANSISTOR	DTC144EU	
Q014	8-729-822-48	TRANSISTOR	FC101	
Q015	8-729-905-35	TRANSISTOR	2SC4081-R	
Q016	8-729-905-23	TRANSISTOR	2SA1576-R	
Q017	8-729-907-03	TRANSISTOR	FMG5	
Q018	8-729-905-18	TRANSISTOR	DTC144EU	
Q150	8-729-905-23	TRANSISTOR	2SA1576-R	
Q151	8-729-905-18	TRANSISTOR	DTC144EU	
Q152	8-729-905-35	TRANSISTOR	2SC4081-R	
Q153	8-729-905-23	TRANSISTOR	2SA1576-R	
Q201	8-729-905-35	TRANSISTOR	2SC4081-R	
Q202	8-729-905-35	TRANSISTOR	2SC4081-R	
Q203	8-729-905-35	TRANSISTOR	2SC4081-R	
Q208	8-729-216-22	TRANSISTOR	2SA1162	
Q209	8-729-905-18	TRANSISTOR	DTC144EU	
Q213	8-729-216-22	TRANSISTOR	2SA1162	
Q214	8-729-119-76	TRANSISTOR	2SA1175-HFE	
Q215	8-729-216-22	TRANSISTOR	2SA1162	
Q217	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q218	8-729-905-35	TRANSISTOR	2SC4081-R	
Q219	8-729-905-35	TRANSISTOR	2SC4081-R	
Q221	8-729-905-35	TRANSISTOR	2SC4081-R	
Q222	8-729-907-00	TRANSISTOR	DTC114EU	
Q223	8-729-905-35	TRANSISTOR	2SC4081-R	
Q224	8-729-904-07	TRANSISTOR	FMG2	
Q225	8-729-905-45	TRANSISTOR	DTA143EU	
Q227	8-729-905-35	TRANSISTOR	2SC4081-R	
Q229	8-729-141-48	TRANSISTOR	2SB624-BV345	
Q230	8-729-141-48	TRANSISTOR	2SB624-BV345	
Q231	8-729-905-18	TRANSISTOR	DTC144EU	
Q232	8-729-905-18	TRANSISTOR	DTC144EU	
Q238	8-729-117-31	TRANSISTOR	2SC4177-L5	
Q239	8-729-905-18	TRANSISTOR	DTC144EU	
Q240	8-729-905-18	TRANSISTOR	DTC144EU	
Q242	8-729-117-31	TRANSISTOR	2SC4177-L5	
Q243	8-729-905-18	TRANSISTOR	DTC144EU	
Q244	8-729-140-63	TRANSISTOR	2SA1611-M5M6	
Q245	8-729-117-31	TRANSISTOR	2SC4177-L5	
Q246	8-729-905-18	TRANSISTOR	DTC144EU	

Ref. No.	Part No.	Description		Remark
Q247	8-729-905-35	TRANSISTOR	2SC4081-R	
Q248	8-729-903-10	TRANSISTOR	FMW1	
Q249	8-729-905-18	TRANSISTOR	DTC144EU	
Q250	8-729-905-12	TRANSISTOR	DTA144EU	
Q251	8-729-905-35	TRANSISTOR	2SC4081-R	
Q252	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q253	8-729-320-17	TRANSISTOR	2SA1122CD	
Q254	8-729-905-35	TRANSISTOR	2SC4081-R	
Q255	8-729-904-07	TRANSISTOR	FMG2	
Q256	8-729-905-12	TRANSISTOR	DTA144EU	
Q257	8-729-905-18	TRANSISTOR	DTC144EU	
Q258	8-729-903-10	TRANSISTOR	FMW1	
Q259	8-729-905-35	TRANSISTOR	2SC4081-R	
Q260	8-729-905-35	TRANSISTOR	2SC4081-R	
Q261	8-729-905-23	TRANSISTOR	2SA1576-R	
Q262	8-729-905-23	TRANSISTOR	2SA1576-R	
Q263	8-729-907-26	TRANSISTOR	IMX1	
Q265	8-729-905-35	TRANSISTOR	2SC4081-R	
Q266	8-729-905-35	TRANSISTOR	2SC4081-R	
Q267	8-729-905-35	TRANSISTOR	2SC4081-R	
Q268	8-729-905-23	TRANSISTOR	2SA1576-R	
Q269	8-729-907-26	TRANSISTOR	IMX1	
Q270	8-729-905-12	TRANSISTOR	DTA144EU	
Q272	8-729-922-94	TRANSISTOR	DTC143TU	
Q273	8-729-141-48	TRANSISTOR	2SB624-BV345	
Q277	8-729-905-35	TRANSISTOR	2SC4081-R	
Q278	8-729-905-35	TRANSISTOR	2SC4081-R	
Q279	8-729-905-18	TRANSISTOR	DTC144EU	
Q280	8-729-905-35	TRANSISTOR	2SC4081-R	
Q282	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q283	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q284	8-729-905-35	TRANSISTOR	2SC4081-R	
Q285	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q286	8-729-105-68	TRANSISTOR	2SC3356-K	
Q287	8-729-924-46	TRANSISTOR	DTC124XU	
Q288	8-729-905-12	TRANSISTOR	DTA144EU	
Q289	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q290	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q291	8-729-907-26	TRANSISTOR	IMX1	
Q292	8-729-905-12	TRANSISTOR	DTA144EU	
Q294	8-729-905-18	TRANSISTOR	DTC144EU	
Q295	8-729-905-35	TRANSISTOR	2SC4081-R	

< RESISTOR >

R001	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R002	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R003	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R004	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R005	1-216-845-11	METAL CHIP	100K	5%	1/16W	

Ref. No.	Part No.	Description			Remark
R006	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R007	1-216-845-11	METAL CHIP	100K	5%	1/16W
R008	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R009	1-216-818-11	METAL CHIP	560	5%	1/16W
R010	1-216-833-11	METAL CHIP	10K	5%	1/16W
R011	1-216-833-11	METAL CHIP	10K	5%	1/16W
R012	1-216-821-11	METAL CHIP	1K	5%	1/16W
R014	1-216-851-11	METAL CHIP	330K	5%	1/16W
R015	1-216-841-11	METAL CHIP	47K	5%	1/16W
R016	1-216-833-11	METAL CHIP	10K	5%	1/16W
R017	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R018	1-216-850-11	METAL CHIP	270K	5%	1/16W
R019	1-216-851-11	METAL CHIP	330K	5%	1/16W
R021	1-216-833-11	METAL CHIP	10K	5%	1/16W
R022	1-216-295-00	METAL CHIP	0	5%	1/10W
R023	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R024	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R025	1-216-837-11	METAL CHIP	22K	5%	1/16W
R028	1-216-864-11	METAL CHIP	0		
R029	1-216-833-11	METAL CHIP	10K	5%	1/16W
R030	1-216-833-11	METAL CHIP	10K	5%	1/16W
R031	1-216-821-11	METAL CHIP	1K	5%	1/16W
R032	1-216-037-00	METAL CHIP	330	5%	1/10W
R033	1-216-821-11	METAL CHIP	1K	5%	1/16W
R034	1-216-845-11	METAL CHIP	100K	5%	1/16W
R035	1-216-097-00	METAL CHIP	100K	5%	1/10W
R036	1-216-845-11	METAL CHIP	100K	5%	1/16W
R037	1-216-097-00	METAL CHIP	100K	5%	1/10W
R038	1-216-833-11	METAL CHIP	10K	5%	1/16W
R039	1-216-833-11	METAL CHIP	10K	5%	1/16W
R040	1-216-833-11	METAL CHIP	10K	5%	1/16W
R041	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R042	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R043	1-217-671-11	METAL CHIP	1	5%	1/10W
R044	1-217-671-11	METAL CHIP	1	5%	1/10W
R045	1-217-671-11	METAL CHIP	1	5%	1/10W
R046	1-217-671-11	METAL CHIP	1	5%	1/10W
R049	1-216-841-11	METAL CHIP	47K	5%	1/16W
R050	1-216-835-11	METAL CHIP	15K	5%	1/16W
R051	1-216-844-11	METAL CHIP	82K	5%	1/16W
R053	1-216-833-11	METAL CHIP	10K	5%	1/16W
R054	1-216-838-11	METAL CHIP	27K	5%	1/16W
R055	1-216-838-11	METAL CHIP	27K	5%	1/16W
R056	1-216-838-11	METAL CHIP	27K	5%	1/16W
R057	1-216-336-11	METAL CHIP	47K	1%	1/10W
R058	1-216-336-11	METAL CHIP	47K	1%	1/10W
R059	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R060	1-216-845-11	METAL CHIP	100K	5%	1/16W
R061	1-216-833-11	METAL CHIP	10K	5%	1/16W
R063	1-216-037-00	METAL CHIP	330	5%	1/10W
R066	1-216-857-11	METAL CHIP	1M	5%	1/16W
R067	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R068	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R069	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R070	1-216-845-11	METAL CHIP	100K	5%	1/16W
R071	1-216-814-11	METAL CHIP	270	5%	1/16W
R072	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R073	1-216-821-11	METAL CHIP	1K	5%	1/16W
R074	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R075	1-216-839-11	METAL CHIP	33K	5%	1/16W
R076	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R077	1-216-837-11	METAL CHIP	22K	5%	1/16W
R078	1-216-821-11	METAL CHIP	1K	5%	1/16W
R079	1-216-839-11	METAL CHIP	33K	5%	1/16W
R080	1-216-837-11	METAL CHIP	22K	5%	1/16W
R082	1-216-833-11	METAL CHIP	10K	5%	1/16W
R083	1-216-833-11	METAL CHIP	10K	5%	1/16W
R084	1-216-833-11	METAL CHIP	10K	5%	1/16W
R085	1-216-833-11	METAL CHIP	10K	5%	1/16W
R086	1-216-833-11	METAL CHIP	10K	5%	1/16W
R087	1-216-833-11	METAL CHIP	10K	5%	1/16W
R088	1-216-833-11	METAL CHIP	10K	5%	1/16W
R089	1-216-833-11	METAL CHIP	10K	5%	1/16W
R090	1-216-833-11	METAL CHIP	10K	5%	1/16W
R095	1-216-821-11	METAL CHIP	1K	5%	1/16W
R097	1-216-833-11	METAL CHIP	10K	5%	1/16W
R098	1-216-833-11	METAL CHIP	10K	5%	1/16W
R099	1-216-845-11	METAL CHIP	100K	5%	1/16W
R100	1-216-843-11	METAL CHIP	68K	5%	1/16W
R105	1-216-821-11	METAL CHIP	1K	5%	1/16W
R106	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R107	1-216-833-11	METAL CHIP	10K	5%	1/16W
R108	1-216-821-11	METAL CHIP	1K	5%	1/16W
R109	1-216-821-11	METAL CHIP	1K	5%	1/16W
R110	1-216-821-11	METAL CHIP	1K	5%	1/16W
R111	1-216-821-11	METAL CHIP	1K	5%	1/16W
R112	1-216-821-11	METAL CHIP	1K	5%	1/16W
R113	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R115	1-216-864-11	METAL CHIP	0		
R120	1-216-833-11	METAL CHIP	10K	5%	1/16W
R121	1-216-845-11	METAL CHIP	100K	5%	1/16W
R122	1-216-845-11	METAL CHIP	100K	5%	1/16W
R123	1-216-839-11	METAL CHIP	33K	5%	1/16W
R124	1-216-853-11	METAL CHIP	470K	5%	1/16W
R125	1-216-836-11	METAL CHIP	18K	5%	1/16W
R127	1-216-833-11	METAL CHIP	10K	5%	1/16W
R129	1-216-864-11	METAL CHIP	0		
R130	1-216-842-11	METAL CHIP	56K	5%	1/16W

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Ref. No.	Part No.	Description			Remark
R131	1-216-833-11	METAL CHIP	10K	5%	1/16W
R132	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R133	1-216-833-11	METAL CHIP	10K	5%	1/16W
R134	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R137	1-216-857-11	METAL CHIP	1M	5%	1/16W
R138	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R139	1-216-821-11	METAL CHIP	1K	5%	1/16W
R140	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R141	1-216-853-11	METAL CHIP	470K	5%	1/16W
R142	1-216-845-11	METAL CHIP	100K	5%	1/16W
R143	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R144	1-216-841-11	METAL CHIP	47K	5%	1/16W
R145	1-216-841-11	METAL CHIP	47K	5%	1/16W
R146	1-216-833-11	METAL CHIP	10K	5%	1/16W
R147	1-216-833-11	METAL CHIP	10K	5%	1/16W
R148	1-216-837-11	METAL CHIP	22K	5%	1/16W
R150	1-216-857-11	METAL CHIP	1M	5%	1/16W
R151	1-216-820-11	METAL CHIP	820	5%	1/16W
R152	1-216-817-11	METAL CHIP	470	5%	1/16W
R153	1-216-817-11	METAL CHIP	470	5%	1/16W
R154	1-216-839-11	METAL CHIP	33K	5%	1/16W
R155	1-216-818-11	METAL CHIP	560	5%	1/16W
R156	1-216-814-11	METAL CHIP	270	5%	1/16W
R157	1-216-840-11	METAL CHIP	39K	5%	1/16W
R158	1-216-812-11	METAL CHIP	180	5%	1/16W
R161	1-216-841-11	METAL CHIP	47K	5%	1/16W
R162	1-216-835-11	METAL CHIP	15K	5%	1/16W
R163	1-216-837-11	METAL CHIP	22K	5%	1/16W
R164	1-216-837-11	METAL CHIP	22K	5%	1/16W
R165	1-216-833-11	METAL CHIP	10K	5%	1/16W
R166	1-216-833-11	METAL CHIP	10K	5%	1/16W
R167	1-216-837-11	METAL CHIP	22K	5%	1/16W
R168	1-216-833-11	METAL CHIP	10K	5%	1/16W
R169	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R170	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R171	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R172	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R173	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R174	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R175	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R176	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R177	1-216-833-11	METAL CHIP	10K	5%	1/16W
R178	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R179	1-216-841-11	METAL CHIP	47K	5%	1/16W
R181	1-216-803-11	METAL CHIP	33	5%	1/16W
R182	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R183	1-216-815-11	METAL CHIP	330	5%	1/16W
R184	1-216-821-11	METAL CHIP	1K	5%	1/16W
R185	1-216-833-11	METAL CHIP	10K	5%	1/16W
R186	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R190	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R193	1-216-833-11	METAL CHIP	10K	5%	1/16W
R201	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R202	1-216-809-11	METAL CHIP	100	5%	1/16W
R206	1-216-821-11	METAL CHIP	1K	5%	1/16W
R207	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R208	1-216-821-11	METAL CHIP	1K	5%	1/16W
R210	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R216	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R217	1-216-844-11	METAL CHIP	82K	5%	1/16W
R218	1-216-821-11	METAL CHIP	1K	5%	1/16W
R219	1-216-845-11	METAL CHIP	100K	5%	1/16W
R228	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R229	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R230	1-216-805-11	METAL CHIP	47	5%	1/16W
R231	1-216-805-11	METAL CHIP	47	5%	1/16W
R232	1-216-818-11	METAL CHIP	560	5%	1/16W
R233	1-216-814-11	METAL CHIP	270	5%	1/16W
R234	1-216-813-11	METAL CHIP	220	5%	1/16W
R235	1-216-837-11	METAL CHIP	22K	5%	1/16W
R236	1-216-839-11	METAL CHIP	33K	5%	1/16W
R237	1-216-821-11	METAL CHIP	1K	5%	1/16W
R238	1-216-811-11	METAL CHIP	150	5%	1/16W
R239	1-216-833-11	METAL CHIP	10K	5%	1/16W
R240	1-216-833-11	METAL CHIP	10K	5%	1/16W
R243	1-216-841-11	METAL CHIP	47K	5%	1/16W
R244	1-216-833-11	METAL CHIP	10K	5%	1/16W
R245	1-216-833-11	METAL CHIP	10K	5%	1/16W
R246	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R247	1-216-816-11	METAL CHIP	390	5%	1/16W
R248	1-216-812-11	METAL CHIP	180	5%	1/16W
R249	1-216-836-11	METAL CHIP	18K	5%	1/16W
R250	1-216-837-11	METAL CHIP	22K	5%	1/16W
R251	1-216-817-11	METAL CHIP	470	5%	1/16W
R252	1-216-817-11	METAL CHIP	470	5%	1/16W
R254	1-216-821-11	METAL CHIP	1K	5%	1/16W
R255	1-216-817-11	METAL CHIP	470	5%	1/16W
R256	1-216-837-11	METAL CHIP	22K	5%	1/16W
R257	1-216-837-11	METAL CHIP	22K	5%	1/16W
R258	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R259	1-216-817-11	METAL CHIP	470	5%	1/16W
R260	1-216-817-11	METAL CHIP	470	5%	1/16W
R261	1-216-817-11	METAL CHIP	470	5%	1/16W
R262	1-216-815-11	METAL CHIP	330	5%	1/16W
R264	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R267	1-216-841-11	METAL CHIP	47K	5%	1/16W
R268	1-216-841-11	METAL CHIP	47K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R269	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R270	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R282	1-216-864-11	METAL CHIP	0		
R285	1-216-837-11	METAL CHIP	22K	5%	1/16W
R286	1-216-837-11	METAL CHIP	22K	5%	1/16W
R287	1-216-817-11	METAL CHIP	470	5%	1/16W
R288	1-216-817-11	METAL CHIP	470	5%	1/16W
R291	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R292	1-216-821-11	METAL CHIP	1K	5%	1/16W
R293	1-216-817-11	METAL CHIP	470	5%	1/16W
R294	1-216-817-11	METAL CHIP	470	5%	1/16W
R295	1-216-833-11	METAL CHIP	10K	5%	1/16W
R300	1-216-817-11	METAL CHIP	470	5%	1/16W
R301	1-216-817-11	METAL CHIP	470	5%	1/16W
R302	1-216-821-11	METAL CHIP	1K	5%	1/16W
R303	1-216-821-11	METAL CHIP	1K	5%	1/16W
R304	1-216-818-11	METAL CHIP	560	5%	1/16W
R305	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R306	1-216-817-11	METAL CHIP	470	5%	1/16W
R307	1-216-821-11	METAL CHIP	1K	5%	1/16W
R308	1-216-821-11	METAL CHIP	1K	5%	1/16W
R309	1-216-821-11	METAL CHIP	1K	5%	1/16W
R310	1-216-821-11	METAL CHIP	1K	5%	1/16W
R311	1-216-821-11	METAL CHIP	1K	5%	1/16W
R312	1-216-821-11	METAL CHIP	1K	5%	1/16W
R313	1-216-821-11	METAL CHIP	1K	5%	1/16W
R314	1-216-821-11	METAL CHIP	1K	5%	1/16W
R315	1-216-821-11	METAL CHIP	1K	5%	1/16W
R316	1-216-814-11	METAL CHIP	270	5%	1/16W
R317	1-216-814-11	METAL CHIP	270	5%	1/16W
R318	1-216-837-11	METAL CHIP	22K	5%	1/16W
R319	1-216-837-11	METAL CHIP	22K	5%	1/16W
R320	1-216-817-11	METAL CHIP	470	5%	1/16W
R321	1-216-817-11	METAL CHIP	470	5%	1/16W
R323	1-216-817-11	METAL CHIP	470	5%	1/16W
R324	1-216-809-11	METAL CHIP	100	5%	1/16W
R325	1-216-813-11	METAL CHIP	220	5%	1/16W
R326	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R327	1-216-837-11	METAL CHIP	22K	5%	1/16W
R328	1-216-838-11	METAL CHIP	27K	5%	1/16W
R329	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R330	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R331	1-216-817-11	METAL CHIP	470	5%	1/16W
R332	1-216-821-11	METAL CHIP	1K	5%	1/16W
R333	1-216-821-11	METAL CHIP	1K	5%	1/16W
R334	1-216-820-11	METAL CHIP	820	5%	1/16W
R335	1-216-817-11	METAL CHIP	470	5%	1/16W
R336	1-216-821-11	METAL CHIP	1K	5%	1/16W
R337	1-216-828-11	METAL CHIP	3.9K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R338	1-216-817-11	METAL CHIP	470	5%	1/16W
R339	1-216-836-11	METAL CHIP	18K	5%	1/16W
R340	1-216-833-11	METAL CHIP	10K	5%	1/16W
R341	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R342	1-216-833-11	METAL CHIP	10K	5%	1/16W
R344	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R345	1-216-836-11	METAL CHIP	18K	5%	1/16W
R346	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R347	1-216-846-11	METAL CHIP	120K	5%	1/16W
R348	1-216-845-11	METAL CHIP	100K	5%	1/16W
R349	1-216-833-11	METAL CHIP	10K	5%	1/16W
R351	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R352	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R353	1-216-817-11	METAL CHIP	470	5%	1/16W
R354	1-216-833-11	METAL CHIP	10K	5%	1/16W
R355	1-216-855-11	METAL CHIP	680K	5%	1/16W
R356	1-216-857-11	METAL CHIP	1M	5%	1/16W
R358	1-216-847-11	METAL CHIP	150K	5%	1/16W
R359	1-216-843-11	METAL CHIP	68K	5%	1/16W
R360	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R361	1-216-845-11	METAL CHIP	100K	5%	1/16W
R362	1-216-845-11	METAL CHIP	100K	5%	1/16W
R363	1-216-845-11	METAL CHIP	100K	5%	1/16W
R364	1-216-833-11	METAL CHIP	10K	5%	1/16W
R365	1-216-841-11	METAL CHIP	47K	5%	1/16W
R366	1-216-833-11	METAL CHIP	10K	5%	1/16W
R367	1-216-836-11	METAL CHIP	18K	5%	1/16W
R368	1-216-837-11	METAL CHIP	22K	5%	1/16W
R369	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R370	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R371	1-216-817-11	METAL CHIP	470	5%	1/16W
R372	1-216-809-11	METAL CHIP	100	5%	1/16W
R373	1-216-838-11	METAL CHIP	27K	5%	1/16W
R374	1-216-845-11	METAL CHIP	100K	5%	1/16W
R375	1-216-839-11	METAL CHIP	33K	5%	1/16W
R376	1-216-833-11	METAL CHIP	10K	5%	1/16W
R377	1-216-821-11	METAL CHIP	1K	5%	1/16W
R378	1-216-817-11	METAL CHIP	470	5%	1/16W
R379	1-216-809-11	METAL CHIP	100	5%	1/16W
R380	1-216-849-11	METAL CHIP	220K	5%	1/16W
R381	1-216-837-11	METAL CHIP	22K	5%	1/16W
R382	1-216-837-11	METAL CHIP	22K	5%	1/16W
R383	1-216-838-11	METAL CHIP	27K	5%	1/16W
R384	1-216-850-11	METAL CHIP	270K	5%	1/16W
R385	1-216-838-11	METAL CHIP	27K	5%	1/16W
R386	1-216-833-11	METAL CHIP	10K	5%	1/16W
R387	1-216-833-11	METAL CHIP	10K	5%	1/16W
R390	1-216-821-11	METAL CHIP	1K	5%	1/16W
R391	1-216-823-11	METAL CHIP	1.5K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R392	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R393	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R394	1-216-841-11	METAL CHIP	47K	5%	1/16W
R395	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R400	1-216-817-11	METAL CHIP	470	5%	1/16W
R401	1-216-819-11	METAL CHIP	680	5%	1/16W
R403	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R404	1-216-809-11	METAL CHIP	100	5%	1/16W
R405	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R406	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R407	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R408	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R409	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R501	1-216-809-11	METAL CHIP	100	5%	1/16W
R502	1-216-811-11	METAL CHIP	150	5%	1/16W
R503	1-216-816-11	METAL CHIP	390	5%	1/16W
R504	1-216-817-11	METAL CHIP	470	5%	1/16W
R505	1-216-817-11	METAL CHIP	470	5%	1/16W
R506	1-216-821-11	METAL CHIP	1K	5%	1/16W
R507	1-216-817-11	METAL CHIP	470	5%	1/16W
R508	1-216-818-11	METAL CHIP	560	5%	1/16W
R509	1-216-821-11	METAL CHIP	1K	5%	1/16W
R510	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R511	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R512	1-216-835-11	METAL CHIP	15K	5%	1/16W
R513	1-216-839-11	METAL CHIP	33K	5%	1/16W
R515	1-216-821-11	METAL CHIP	1K	5%	1/16W
R517	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R518	1-216-810-11	METAL CHIP	120	5%	1/16W
R521	1-216-835-11	METAL CHIP	15K	5%	1/16W
R522	1-216-818-11	METAL CHIP	560	5%	1/16W
R523	1-216-817-11	METAL CHIP	470	5%	1/16W
R524	1-216-817-11	METAL CHIP	470	5%	1/16W
R525	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R526	1-216-839-11	METAL CHIP	33K	5%	1/16W
R527	1-216-837-11	METAL CHIP	22K	5%	1/16W
R528	1-216-821-11	METAL CHIP	1K	5%	1/16W
R529	1-216-839-11	METAL CHIP	33K	5%	1/16W
		< VARIABLE RESISTOR >			
RV100	1-238-092-11	RES, ADJ CERMET 47K			
RV201	1-238-222-11	RES, ADJ, METAL 4.7K			
RV202	1-230-869-11	RES, ADJ, METAL 4.7K			
RV203	1-230-869-11	RES, ADJ, METAL 4.7K			
RV205	1-238-089-11	RES, ADJ CERMET 4.7K			
RV206	1-238-088-11	RES, ADJ CERMET 2.2K			
RV207	1-238-087-11	RES, ADJ CERMET 1K			

Ref. No.	Part No.	Description	Remark
		< THERMISTOR >	
TH001	1-800-200-00	THERMISTOR S-3K	
		< TERMINAL >	
TP001	* 1-535-622-11	PIN, TERMINAL	
		< FLEXIBLE BOARD >	
W001	1-634-428-11	FP-257 FLEXIBLE BOARD	
W002	1-634-426-11	FP-255 FLEXIBLE BOARD	
W003	1-634-427-11	FP-256 FLEXIBLE BOARD	
		< CRYSTAL >	
X001	1-577-467-21	VIBRATOR, CRYSTAL	
X150	1-567-699-21	VIBRATOR, CRYSTAL	

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1-634-422-11 SW-120P BOARD (Ref.No 7,000 Series)
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Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN701	* 1-566-764-11	PIN, CONNECTOR (PC BOARD) 9P	
CN702	* 1-566-761-11	PIN, CONNECTOR (PC BOARD) 6P	
CN703	1-575-846-11	CONNECTOR, FPC (NON ZIF) 6P	
		< DIODE >	
D701	8-719-977-34	DIODE DTZ12	
D702	8-719-977-34	DIODE DTZ12	
D705	8-719-977-34	DIODE DTZ12	
		< JACK >	
J701	1-507-929-11	JACK (HEADPHONE)	
J702	1-565-276-21	JACK, ULTRA SMALL 1P (REMOTE)	
		< COIL >	
L701	1-410-369-11	INDUCTOR CHIP 1uH	
L702	1-410-369-11	INDUCTOR CHIP 1uH	
L703	1-410-369-11	INDUCTOR CHIP 1uH	
L704	1-410-369-11	INDUCTOR CHIP 1uH	
L705	1-410-369-11	INDUCTOR CHIP 1uH	
L706	1-410-369-11	INDUCTOR CHIP 1uH	
		< SWITCH >	
S701	1-570-870-11	SWITCH, SLIDE (STANDBY)	
S702	1-571-838-11	SWITCH, TACTIL (REC START/STOP)	

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Ref. No.	Part No.	Description			Remark
	* A-7062-325-A	VA-62 BOARD, COMPLETE			
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		(Ref. No 1.000 Series)			
	* 1-535-622-11	PIN, TERMINAL			
	3-719-381-01	SCREW (M2X4)			
	3-744-791-01	CASE, SHIELD, VA			
	* 3-744-792-01	LID, REAR, VA SHIELD			
	* 3-744-799-01	CASE, SHIELD, FL			
	3-831-441-XX	CUSHION (5)			
	7-627-553-48	PRECISION SCREW +P 2X4 TYPE 3			
		< CAPACITOR >			
C415	1-128-003-11	ELECT CHIP	22uF	20%	4V
C416	1-128-004-11	ELECT CHIP	10uF	20%	16V
C417	1-128-004-11	ELECT CHIP	10uF	20%	16V
C418	1-128-004-11	ELECT CHIP	10uF	20%	16V
C424	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C425	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C426	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C427	1-128-004-11	ELECT CHIP	10uF	20%	16V
C428	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C430	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C435	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C436	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C437	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C439	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C447	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C448	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C449	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C450	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C451	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C461	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C462	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C464	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C465	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C466	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C467	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C468	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C470	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C472	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C551	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C555	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C556	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C557	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C558	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C559	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C562	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C563	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C564	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C565	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C566	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C567	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C568	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C601	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C602	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C603	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C604	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C605	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C606	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C607	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C608	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C611	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C612	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C650	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C651	1-128-004-11	ELECT CHIP	10uF	20%	16V
C652	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C653	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C654	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C655	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C656	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C657	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C658	1-128-004-11	ELECT CHIP	10uF	20%	16V
C659	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C660	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C662	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C663	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C664	1-128-004-11	ELECT CHIP	10uF	20%	16V
C665	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C666	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V
C667	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C668	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C669	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C670	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C671	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C672	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C673	1-128-004-11	ELECT CHIP	10uF	20%	16V
C674	1-126-207-11	ELECT CHIP	33uF	20%	4V
C675	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C676	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C680	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C681	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C682	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C685	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C686	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C687	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C688	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C689	1-163-129-00	CERAMIC CHIP	330PF	5%	50V

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Ref. No.	Part No.	Description			Remark
C690	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C691	1-126-154-11	ELECT	47uF	20%	6.3V
C692	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C695	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C696	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C697	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C698	1-135-176-21	TANTALUM CHIP	0.68uF	10%	20V
C699	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C700	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C701	1-128-004-11	ELECT CHIP	10uF	20%	16V
C702	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C703	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C705	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C706	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C707	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C708	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C709	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C710	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C712	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C713	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C714	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C715	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C716	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C717	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C718	1-136-015-00	CERAMIC CHIP	0.0033uF		50V
C719	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C720	1-126-199-11	ELECT CHIP	6.8uF	20%	35V
C721	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C722	1-163-118-00	CERAMIC CHIP	110PF	5%	50V
C723	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C724	1-126-601-11	ELECT	2.2uF	20%	50V
C725	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C726	1-164-145-11	CERAMIC CHIP	390PF	5%	50V
C727	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C728	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C729	1-126-603-11	ELECT CHIP	4.7uF	20%	35V
C730	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C731	1-128-013-11	ELECT CHIP	1uF	20%	50V
C733	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C734	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C735	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V
C736	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C737	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C738	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V
C739	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C741	1-162-938-11	CERAMIC CHIP	7PF	0.5PF	50V
C742	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C743	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C745	1-162-942-11	CERAMIC CHIP	12PF	5%	50V

Ref. No.	Part No.	Description			Remark
C746	1-162-998-11	CERAMIC CHIP	22PF	5%	50V
C747	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C748	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C749	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C750	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C751	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C752	1-126-163-11	ELECT	4.7uF	20%	50V
C753	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C754	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C755	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C756	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C757	1-162-934-11	CERAMIC CHIP	3PF	0.25PF	50V
C758	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C759	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C760	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C761	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C763	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C764	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C765	1-128-004-11	ELECT CHIP	10uF	20%	16V
C766	1-126-245-11	ELECT	330uF	20%	6.3V
C767	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C768	1-126-607-11	ELECT CHIP	47uF	20%	4V
C769	1-128-004-11	ELECT CHIP	10uF	20%	16V
C771	1-128-003-11	ELECT CHIP	22uF	20%	4V
C772	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C774	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C775	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C776	1-126-155-11	ELECT	100uF	20%	6.3V
C777	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C778	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C779	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C780	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C781	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C782	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C783	1-128-003-11	ELECT CHIP	22uF	20%	4V
C784	1-128-004-11	ELECT CHIP	10uF	20%	16V
C785	1-126-607-11	ELECT CHIP	47uF	20%	4V
C786	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C787	1-128-004-11	ELECT CHIP	10uF	20%	16V
C788	1-128-004-11	ELECT CHIP	10uF	20%	16V
C789	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C790	1-162-938-11	CERAMIC CHIP	7PF	0.5PF	50V
C794	1-164-634-11	CERAMIC CHIP	1uF		16V
C796	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C797	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C798	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C799	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C800	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C801	1-163-833-00	CERAMIC CHIP	0.068uF		25V

Ref. No.	Part No.	Description			Remark
C802	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C803	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C804	1-128-004-11	ELECT CHIP	10uF	20%	16V
C805	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C806	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C808	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C809	1-164-634-11	CERAMIC CHIP	1uF		16V
C811	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C812	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C813	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C814	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C815	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C816	1-128-004-11	ELECT CHIP	10uF	20%	16V
C817	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C818	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C819	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C821	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C824	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C826	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C827	1-128-004-11	ELECT CHIP	10uF	20%	16V
C828	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C829	1-128-004-11	ELECT CHIP	10uF	20%	16V
C830	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C831	1-126-425-11	ELECT	10uF	20%	10V
C832	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C833	1-128-004-11	ELECT CHIP	10uF	20%	16V
C836	1-128-004-11	ELECT CHIP	10uF	20%	16V
C837	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C838	1-126-245-11	ELECT	330uF	20%	6.3V
C839	1-126-607-11	ELECT CHIP	47uF	20%	4V
C840	1-128-004-11	ELECT CHIP	10uF	20%	16V
C841	1-128-004-11	ELECT CHIP	10uF	20%	16V
C842	1-128-004-11	ELECT CHIP	10uF	20%	16V
C843	1-126-607-11	ELECT CHIP	47uF	20%	4V
C844	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C845	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C848	1-128-004-11	ELECT CHIP	10uF	20%	16V
C850	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C851	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C856	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C857	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C858	1-126-245-11	ELECT	330uF	20%	6.3V
C859	1-128-004-11	ELECT CHIP	10uF	20%	16V
C860	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C861	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C862	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C863	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C864	1-162-974-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remark
C865	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C867	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C869	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C870	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C871	1-128-004-11	ELECT CHIP	10uF	20%	16V
C872	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C873	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C875	1-128-003-11	ELECT CHIP	22uF	20%	4V
C876	1-128-004-11	ELECT CHIP	10uF	20%	16V
C878	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C880	1-128-003-11	ELECT CHIP	22uF	20%	4V
C881	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C890	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C892	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C894	1-162-950-11	CERAMIC CHIP	56PF	5%	50V

< FILTER >

Ref. No.	Part No.	Description			Remark
CF650	1-577-162-11	FILTER, CERAMIC			

< CONNECTOR >

Ref. No.	Part No.	Description			Remark
CN551	1-568-801-11	CONNECTOR, FPC (ZIF) 24P			
CN552	* 1-565-875-11	PIN, CONNECTOR (PC BOARD) 3P			
CN650	* 1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P			

< DIODE >

Ref. No.	Part No.	Description			Remark
D415	8-719-421-30	DIODE	MA141A		
D417	8-719-941-86	DIODE	DAN202U		
D419	8-719-941-09	DIODE	DAP202U		
D420	8-719-941-86	DIODE	DAN202U		
D422	8-719-941-86	DIODE	DAN202U		
D423	8-719-941-86	DIODE	DAN202U		
D427	8-719-941-86	DIODE	DAN202U		
D428	8-719-941-86	DIODE	DAN202U		
D432	8-719-941-86	DIODE	DAN202U		
D433	8-719-941-09	DIODE	DAP202U		
D434	8-719-941-09	DIODE	DAP202U		
D435	8-719-941-86	DIODE	DAN202U		
D436	8-719-941-86	DIODE	DAN202U		
D437	8-719-941-86	DIODE	DAN202U		
D551	8-719-404-46	DIODE	MA110		
D552	8-719-941-86	DIODE	DAN202U		
D553	8-719-941-86	DIODE	DAN202U		
D554	8-719-404-46	DIODE	MA110		
D650	8-719-941-86	DIODE	DAN202U		
D651	8-719-941-86	DIODE	DAN202U		
D652	8-719-941-86	DIODE	DAN202U		
D653	8-719-941-86	DIODE	DAN202U		
D654	8-719-941-86	DIODE	DAN202U		

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Ref. No.	Part No.	Description	Remark
D655	8-719-800-76	DIODE 1SS226	
D656	8-719-941-86	DIODE DAN202U	
D657	8-719-800-76	DIODE 1SS226	
D658	8-719-941-86	DIODE DAN202U	
D659	8-719-941-86	DIODE DAN202U	
D661	8-719-941-86	DIODE DAN202U	
D662	8-719-951-22	DIODE IMN10	
D663	8-719-941-86	DIODE DAN202U	
D664	8-719-941-86	DIODE DAN202U	
D667	8-719-941-86	DIODE DAN202U	
D669	8-719-977-22	DIODE DTZ9. 1	
D670	8-719-977-22	DIODE DTZ9. 1	
D671	8-719-977-22	DIODE DTZ9. 1	
D672	8-719-977-22	DIODE DTZ9. 1	
D673	8-719-800-76	DIODE 1SS226	
D674	8-719-977-22	DIODE DTZ9. 1	
D675	8-719-977-22	DIODE DTZ9. 1	
D676	8-719-977-22	DIODE DTZ9. 1	
D679	8-719-977-22	DIODE DTZ9. 1	
D680	8-719-977-22	DIODE DTZ9. 1	
D681	8-719-977-22	DIODE DTZ9. 1	
D682	8-719-977-22	DIODE DTZ9. 1	
D683	8-719-977-22	DIODE DTZ9. 1	
D690	8-719-941-86	DIODE DAN202U	

< FILTER >

Ref. No.	Part No.	Description	Remark
FL650	1-236-186-11	FILTER, BAND PASS	
FL651	1-236-849-21	FILTER, BAND PASS	
FL652	1-236-850-21	FILTER, BAND PASS	
FL653	1-415-729-21	DELAY LINE, LC (Y)	
FL654	1-415-764-21	DELAY LINE, LC	
FL655	1-236-848-21	FILTER, LOW PASS	
FL656	1-239-010-11	FILTER, LOW PASS (CCD. PAL. Y)	
FL657	1-236-775-11	FILTER, LOW PASS (DEM)	
FL658	1-236-774-11	FILTER, LOW PASS (Y)	

< IC >

Ref. No.	Part No.	Description	Remark
IC416	8-759-710-09	IC NJM2233AM	
IC551	8-759-300-71	IC MC14053BF	
IC553	8-759-998-98	IC LM358D	
IC554	8-759-008-67	IC MC14066BF	
IC555	8-759-701-02	IC NJM2073M	
IC650	8-752-036-19	IC CXA1207R	
IC651	8-752-036-20	IC CXA1208R	
IC652	8-759-605-61	IC CXA1203N	
IC653	8-759-925-60	IC BA401	
IC654	8-752-009-51	IC CX20095A	
IC656	8-759-320-76	IC HA118070FP	
IC657	8-752-333-24	IC CXL1506M	
IC658	8-752-333-24	IC CXL1506M	
IC659	8-759-710-29	IC NJM2235M	
IC660	8-759-710-07	IC NJM2234M	
IC661	8-759-710-07	IC NJM2234M	
IC662	8-759-009-22	IC MC14094BF	
IC663	8-759-710-29	IC NJM2235M	

< JACK >

Ref. No.	Part No.	Description	Remark
J650	1-566-850-31	CONNECTOR, (S) TERMINAL 4P (S VIDEO)	
J651	1-569-556-11	JACK (VIDEO/AUDIO/RFU DC)	

< COIL >

Ref. No.	Part No.	Description	Remark
L443	1-412-058-11	INDUCTOR CHIP 10uH	
L444	1-410-379-31	INDUCTOR CHIP 6. 8uH	
L445	1-410-385-11	INDUCTOR CHIP 22uH	
L446	1-410-381-11	INDUCTOR CHIP 10uH	
L447	1-410-379-21	INDUCTOR CHIP 6. 8uH	
L448	1-410-389-31	INDUCTOR CHIP 47uH	
L650	1-410-391-11	INDUCTOR CHIP 68uH	
L653	1-410-381-11	INDUCTOR CHIP 10uH	
L654	1-410-390-11	INDUCTOR CHIP 56uH	
L657	1-410-386-11	INDUCTOR CHIP 27uH	
L658	1-410-393-11	INDUCTOR CHIP 100uH	
L659	1-410-655-31	INDUCTOR CHIP 120uH	
L660	1-410-393-11	INDUCTOR CHIP 100uH	
L661	1-410-656-11	INDUCTOR CHIP 150uH	
L662	1-410-393-11	INDUCTOR CHIP 100uH	
L663	1-410-381-11	INDUCTOR CHIP 10uH	
L664	1-410-383-31	INDUCTOR CHIP 15uH	
L665	1-410-386-11	INDUCTOR CHIP 27uH	
L666	1-410-384-31	INDUCTOR CHIP 18uH	
L667	1-408-797-11	INDUCTOR CHIP 470uH	
L668	1-408-797-11	INDUCTOR CHIP 470uH	
L669	1-410-384-31	INDUCTOR CHIP 18uH	
L670	1-410-389-31	INDUCTOR CHIP 47uH	
L671	1-410-389-31	INDUCTOR CHIP 47uH	
L673	1-410-385-11	INDUCTOR CHIP 22uH	
L674	1-410-382-31	INDUCTOR CHIP 12uH	
L675	1-410-383-31	INDUCTOR CHIP 15uH	
L676	1-410-380-31	INDUCTOR CHIP 8. 2uH	
L677	1-410-379-21	INDUCTOR CHIP 6. 8uH	
L678	1-410-388-21	INDUCTOR CHIP 39uH	
L679	1-410-386-11	INDUCTOR CHIP 27uH	
L681	1-412-058-11	INDUCTOR CHIP 10uH	
L682	1-410-389-31	INDUCTOR CHIP 47uH	
L683	1-412-058-11	INDUCTOR CHIP 10uH	
L684	1-410-389-31	INDUCTOR CHIP 47uH	

Ref. No.	Part No.	Description	Remark
L685	1-410-389-31	INDUCTOR CHIP 47uH	
L686	1-410-385-11	INDUCTOR CHIP 22uH	
L687	1-410-387-11	INDUCTOR CHIP 33uH	
L688	1-410-378-11	INDUCTOR CHIP 5.6uH	
L689	1-410-389-31	INDUCTOR CHIP 47uH	
L690	1-410-369-11	INDUCTOR CHIP 1uH	
L691	1-410-389-31	INDUCTOR CHIP 47uH	
L692	1-410-655-31	INDUCTOR CHIP 120uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q411	8-729-905-23	TRANSISTOR 2SA1576-R	
Q415	8-729-905-23	TRANSISTOR 2SA1576-R	
Q416	8-729-905-35	TRANSISTOR 2SC4081-R	
Q417	8-729-905-12	TRANSISTOR DTA144EU	
Q418	8-729-905-35	TRANSISTOR 2SC4081-R	
Q421	8-729-905-23	TRANSISTOR 2SA1576-R	
Q422	8-729-905-18	TRANSISTOR DTC144EU	
Q423	8-729-905-35	TRANSISTOR 2SC4081-R	
Q426	8-729-905-35	TRANSISTOR 2SC4081-R	
Q427	8-729-905-35	TRANSISTOR 2SC4081-R	
Q428	8-729-905-XX	TRANSISTOR DTC114TU	
Q429	8-729-905-35	TRANSISTOR 2SC4081-R	
Q430	8-729-905-18	TRANSISTOR DTC144EU	
Q431	8-729-905-23	TRANSISTOR 2SA1576-R	
Q432	8-729-905-23	TRANSISTOR 2SA1576-R	
Q433	8-729-905-35	TRANSISTOR 2SC4081-R	
Q434	8-729-905-23	TRANSISTOR 2SA1576-R	
Q439	8-729-905-12	TRANSISTOR DTA144EU	
Q440	8-729-905-35	TRANSISTOR 2SC4081-R	
Q442	8-729-905-18	TRANSISTOR DTC144EU	
Q443	8-729-905-18	TRANSISTOR DTC144EU	
Q444	8-729-905-35	TRANSISTOR 2SC4081-R	
Q446	8-729-905-35	TRANSISTOR 2SC4081-R	
Q447	8-729-905-12	TRANSISTOR DTA144EU	
Q448	8-729-905-18	TRANSISTOR DTC144EU	
Q452	8-729-905-18	TRANSISTOR DTC144EU	
Q456	8-729-905-18	TRANSISTOR DTC144EU	
Q469	8-729-905-18	TRANSISTOR DTC144EU	
Q490	8-729-905-35	TRANSISTOR 2SC4081-R	
Q491	8-729-905-12	TRANSISTOR DTA144EU	
Q493	8-729-905-12	TRANSISTOR DTA144EU	
Q494	8-729-905-35	TRANSISTOR 2SC4081-R	
Q496	8-729-905-35	TRANSISTOR 2SC4081-R	
Q497	8-729-905-18	TRANSISTOR DTC144EU	
Q498	8-729-905-18	TRANSISTOR DTC144EU	
Q551	8-729-905-23	TRANSISTOR 2SA1576-R	
Q552	8-729-905-23	TRANSISTOR 2SA1576-R	
Q553	8-729-905-35	TRANSISTOR 2SC4081-R	
Q554	8-729-905-35	TRANSISTOR 2SC4081-R	

Ref. No.	Part No.	Description	Remark
Q555	8-729-905-35	TRANSISTOR 2SC4081-R	
Q556	8-729-905-35	TRANSISTOR 2SC4081-R	
Q557	8-729-905-18	TRANSISTOR DTC144EU	
Q558	8-729-905-12	TRANSISTOR DTA144EU	
Q559	8-729-905-23	TRANSISTOR 2SA1576-R	
Q560	8-729-905-18	TRANSISTOR DTC144EU	
Q561	8-729-907-26	TRANSISTOR IMX1	
Q562	8-729-904-07	TRANSISTOR FMG2	
Q603	8-729-905-35	TRANSISTOR 2SC4081-R	
Q606	8-729-902-93	TRANSISTOR FMG4	
Q607	8-729-922-94	TRANSISTOR DTC143TU	
Q608	8-729-905-23	TRANSISTOR 2SA1576-R	
Q643	8-729-905-23	TRANSISTOR 2SA1576-R	
Q645	8-729-905-18	TRANSISTOR DTC144EU	
Q647	8-729-905-18	TRANSISTOR DTC144EU	
Q648	8-729-905-12	TRANSISTOR DTA144EU	
Q649	8-729-905-18	TRANSISTOR DTC144EU	
Q653	8-729-905-18	TRANSISTOR DTC144EU	
Q655	8-729-905-12	TRANSISTOR DTA144EU	
Q657	8-729-905-35	TRANSISTOR 2SC4081-R	
Q658	8-729-905-35	TRANSISTOR 2SC4081-R	
Q659	8-729-905-35	TRANSISTOR 2SC4081-R	
Q660	8-729-905-35	TRANSISTOR 2SC4081-R	
Q661	8-729-905-12	TRANSISTOR DTA144EU	
Q662	8-729-905-96	TRANSISTOR DTA114TU	
Q665	8-729-905-45	TRANSISTOR DTA143EU	
Q666	8-729-905-23	TRANSISTOR 2SA1576-R	
Q667	8-729-905-18	TRANSISTOR DTC144EU	
Q668	8-729-905-35	TRANSISTOR 2SC4081-R	
Q669	8-729-905-12	TRANSISTOR DTA144EU	
Q670	8-729-903-10	TRANSISTOR FMW1	
Q671	8-729-905-23	TRANSISTOR 2SA1576-R	
Q672	8-729-905-18	TRANSISTOR DTC144EU	
Q673	8-729-905-12	TRANSISTOR DTA144EU	
Q674	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q675	8-729-905-18	TRANSISTOR DTC144EU	
Q676	8-729-905-12	TRANSISTOR DTA144EU	
Q677	8-729-905-12	TRANSISTOR DTA144EU	
Q678	8-729-202-38	TRANSISTOR 2SC3326N	
Q679	8-729-202-38	TRANSISTOR 2SC3326N	
Q680	8-729-905-35	TRANSISTOR 2SC4081-R	
Q681	8-729-905-35	TRANSISTOR 2SC4081-R	
Q683	8-729-905-23	TRANSISTOR 2SA1576-R	
Q684	8-729-905-18	TRANSISTOR DTC144EU	
Q685	8-729-905-12	TRANSISTOR DTA144EU	
Q686	8-729-905-35	TRANSISTOR 2SC4081-R	
Q687	8-729-905-35	TRANSISTOR 2SC4081-R	
Q688	8-729-905-35	TRANSISTOR 2SC4081-R	
Q689	8-729-905-35	TRANSISTOR 2SC4081-R	

Ref. No.	Part No.	Description		Remark
Q690	8-729-141-48	TRANSISTOR	2SB624-BV345	
Q691	8-729-905-18	TRANSISTOR	DTC144EU	
Q692	8-729-905-18	TRANSISTOR	DTC144EU	
Q693	8-729-905-35	TRANSISTOR	2SC4081-R	
Q694	8-729-905-35	TRANSISTOR	2SC4081-R	
Q696	8-729-905-18	TRANSISTOR	DTC144EU	
Q698	8-729-903-10	TRANSISTOR	FMW1	
Q700	8-729-202-38	TRANSISTOR	2SC3326N	
Q701	8-729-905-35	TRANSISTOR	2SC4081-R	
Q702	8-729-905-35	TRANSISTOR	2SC4081-R	
Q703	8-729-903-10	TRANSISTOR	FMW1	
Q705	8-729-905-12	TRANSISTOR	DTA144EU	
Q707	8-729-904-20	TRANSISTOR	FMA2	
Q708	8-729-904-07	TRANSISTOR	FMG2	
Q711	8-729-905-12	TRANSISTOR	DTA144EU	
Q712	8-729-905-12	TRANSISTOR	DTA144EU	
Q717	8-729-905-23	TRANSISTOR	2SA1576-R	
Q719	8-729-905-18	TRANSISTOR	DTC144EU	
Q721	8-729-202-38	TRANSISTOR	2SC3326N	
Q722	8-729-905-35	TRANSISTOR	2SC4081-R	
Q723	8-729-904-07	TRANSISTOR	FMG2	
Q724	8-729-905-23	TRANSISTOR	2SA1576-R	
Q725	8-729-905-23	TRANSISTOR	2SA1576-R	
Q727	8-729-905-45	TRANSISTOR	DTA143EU	
Q728	8-729-905-23	TRANSISTOR	2SA1576-R	
Q729	8-729-905-35	TRANSISTOR	2SC4081-R	
Q730	8-729-905-23	TRANSISTOR	2SA1576-R	
Q731	8-729-905-12	TRANSISTOR	DTA144EU	
Q732	8-729-905-35	TRANSISTOR	2SC4081-R	
Q733	8-729-905-18	TRANSISTOR	DTC144EU	
Q734	8-729-905-18	TRANSISTOR	DTC144EU	
Q735	8-729-905-35	TRANSISTOR	2SC4081-R	
Q736	8-729-905-45	TRANSISTOR	DTA143EU	
Q737	8-729-905-35	TRANSISTOR	2SC4081-R	
Q738	8-729-905-35	TRANSISTOR	2SC4081-R	
Q742	8-729-905-23	TRANSISTOR	2SA1576-R	
Q743	8-729-905-35	TRANSISTOR	2SC4081-R	
Q744	8-729-905-35	TRANSISTOR	2SC4081-R	
Q745	8-729-905-18	TRANSISTOR	DTC144EU	
Q746	8-729-141-48	TRANSISTOR	2SB624-BV345	
Q747	8-729-905-23	TRANSISTOR	2SA1576-R	
Q748	8-729-905-35	TRANSISTOR	2SC4081-R	
Q751	8-729-905-35	TRANSISTOR	2SC4081-R	
Q752	8-729-905-23	TRANSISTOR	2SA1576-R	
Q753	8-729-904-20	TRANSISTOR	FMA2	
Q756	8-729-905-18	TRANSISTOR	DTC144EU	
Q757	8-729-905-35	TRANSISTOR	2SC4081-R	
Q758	8-729-905-23	TRANSISTOR	2SA1576-R	

Ref. No.	Part No.	Description				Remark
Q759	8-729-905-35	TRANSISTOR	2SC4081-R			
Q760	8-729-905-12	TRANSISTOR	DTA144EU			
Q761	8-729-905-18	TRANSISTOR	DTC144EU			
Q762	8-729-905-18	TRANSISTOR	DTC144EU			
Q763	8-729-905-18	TRANSISTOR	DTC144EU			
Q764	8-729-905-35	TRANSISTOR	2SC4081-R			
Q765	8-729-905-35	TRANSISTOR	2SC4081-R			
Q766	8-729-905-23	TRANSISTOR	2SA1576-R			
Q770	8-729-101-07	TRANSISTOR	2SB798-L			
Q772	8-729-905-12	TRANSISTOR	DTA144EU			
Q773	8-729-905-12	TRANSISTOR	DTA144EU			
Q774	8-729-905-35	TRANSISTOR	2SC4081-R			
Q775	8-729-905-18	TRANSISTOR	DTC144EU			
Q776	8-729-905-12	TRANSISTOR	DTA144EU			
Q777	8-729-905-23	TRANSISTOR	2SA1576-R			
Q778	8-729-905-57	TRANSISTOR	DTA124EU			
Q779	8-729-905-18	TRANSISTOR	DTC144EU			
Q780	8-729-905-18	TRANSISTOR	DTC144EU			
Q781	8-729-905-18	TRANSISTOR	DTC144EU			
Q784	8-729-905-35	TRANSISTOR	2SC4081-R			
Q786	8-729-905-18	TRANSISTOR	DTC144EU			
		< RESISTOR >				
R411	1-216-830-11	METAL CHIP	5. 6K	5%	1/16W	
R412	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R414	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R415	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	
R418	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R419	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R420	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R421	1-216-823-11	METAL CHIP	1. 5K	5%	1/16W	
R422	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R423	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R424	1-216-829-11	METAL CHIP	4. 7K	5%	1/16W	
R425	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R427	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R428	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R429	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R430	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R431	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R439	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R440	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R448	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	
R449	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R451	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	
R452	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R453	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W	
R454	1-216-833-11	METAL CHIP	10K	5%	1/16W	

Ref. No.	Part No.	Description			Remark
R456	1-216-856-11	METAL CHIP	820K	5%	1/16W
R457	1-216-821-11	METAL CHIP	1K	5%	1/16W
R458	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R459	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R461	1-216-833-11	METAL CHIP	10K	5%	1/16W
R462	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R463	1-216-821-11	METAL CHIP	1K	5%	1/16W
R464	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R465	1-216-839-11	METAL CHIP	33K	5%	1/16W
R466	1-216-837-11	METAL CHIP	22K	5%	1/16W
R467	1-216-821-11	METAL CHIP	1K	5%	1/16W
R468	1-216-813-11	METAL CHIP	220	5%	1/16W
R472	1-216-833-11	METAL CHIP	10K	5%	1/16W
R473	1-216-837-11	METAL CHIP	22K	5%	1/16W
R474	1-216-841-11	METAL CHIP	47K	5%	1/16W
R476	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R484	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R486	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R487	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R488	1-216-850-11	METAL CHIP	270K	5%	1/16W
R489	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R491	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R496	1-216-138-00	METAL CHIP	3.3	5%	1/8W
R498	1-216-815-11	METAL CHIP	330	5%	1/16W
R558	1-216-833-11	METAL CHIP	10K	5%	1/16W
R559	1-216-837-11	METAL CHIP	22K	5%	1/16W
R560	1-216-833-11	METAL CHIP	10K	5%	1/16W
R561	1-216-837-11	METAL CHIP	22K	5%	1/16W
R562	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R563	1-216-833-11	METAL CHIP	10K	5%	1/16W
R564	1-216-819-11	METAL CHIP	680	5%	1/16W
R565	1-216-813-11	METAL CHIP	220	5%	1/16W
R567	1-216-833-11	METAL CHIP	10K	5%	1/16W
R568	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R569	1-216-819-11	METAL CHIP	680	5%	1/16W
R570	1-216-813-11	METAL CHIP	220	5%	1/16W
R571	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R572	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R574	1-216-805-11	METAL CHIP	47	5%	1/16W
R575	1-216-805-11	METAL CHIP	47	5%	1/16W
R576	1-216-833-11	METAL CHIP	10K	5%	1/16W
R577	1-216-833-11	METAL CHIP	10K	5%	1/16W
R578	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R579	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R581	1-216-814-11	METAL CHIP	270	5%	1/16W
R582	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R585	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R586	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R587	1-216-837-11	METAL CHIP	22K	5%	1/16W
R588	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R589	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R590	1-216-845-11	METAL CHIP	100K	5%	1/16W
R591	1-216-833-11	METAL CHIP	10K	5%	1/16W
R601	1-216-843-11	METAL CHIP	68K	5%	1/16W
R604	1-216-843-11	METAL CHIP	68K	5%	1/16W
R607	1-216-821-11	METAL CHIP	1K	5%	1/16W
R608	1-216-821-11	METAL CHIP	1K	5%	1/16W
R609	1-216-819-11	METAL CHIP	680	5%	1/16W
R610	1-216-819-11	METAL CHIP	680	5%	1/16W
R611	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R612	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R613	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R617	1-216-853-11	METAL CHIP	470K	5%	1/16W
R619	1-216-845-11	METAL CHIP	100K	5%	1/16W
R620	1-216-855-11	METAL CHIP	680K	5%	1/16W
R621	1-216-841-11	METAL CHIP	47K	5%	1/16W
R622	1-216-841-11	METAL CHIP	47K	5%	1/16W
R623	1-216-837-11	METAL CHIP	22K	5%	1/16W
R625	1-216-833-11	METAL CHIP	10K	5%	1/16W
R627	1-216-853-11	METAL CHIP	470K	5%	1/16W
R630	1-216-821-11	METAL CHIP	1K	5%	1/16W
R631	1-216-819-11	METAL CHIP	680	5%	1/16W
R632	1-216-816-11	METAL CHIP	390	5%	1/16W
R636	1-216-840-11	METAL CHIP	39K	5%	1/16W
R638	1-216-801-11	METAL CHIP	22	5%	1/16W
R642	1-216-821-11	METAL CHIP	1K	5%	1/16W
R643	1-216-812-11	METAL CHIP	180	5%	1/16W
R644	1-216-821-11	METAL CHIP	1K	5%	1/16W
R645	1-216-853-11	METAL CHIP	470K	5%	1/16W
R646	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R647	1-216-837-11	METAL CHIP	22K	5%	1/16W
R648	1-216-837-11	METAL CHIP	22K	5%	1/16W
R649	1-216-818-11	METAL CHIP	560	5%	1/16W
R650	1-216-838-11	METAL CHIP	27K	5%	1/16W
R651	1-216-821-11	METAL CHIP	1K	5%	1/16W
R652	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R654	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R655	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R657	1-216-835-11	METAL CHIP	15K	5%	1/16W
R658	1-216-841-11	METAL CHIP	47K	5%	1/16W
R664	1-216-845-11	METAL CHIP	100K	5%	1/16W
R665	1-216-853-11	METAL CHIP	470K	5%	1/16W
R667	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R669	1-216-833-11	METAL CHIP	10K	5%	1/16W
R670	1-216-821-11	METAL CHIP	1K	5%	1/16W
R671	1-216-821-11	METAL CHIP	1K	5%	1/16W
R672	1-216-833-11	METAL CHIP	10K	5%	1/16W
R673	1-216-833-11	METAL CHIP	10K	5%	1/16W

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Ref. No.	Part No.	Description			Remark
R674	1-216-833-11	METAL CHIP	10K	5%	1/16W
R675	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R676	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R677	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R678	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R679	1-216-839-11	METAL CHIP	33K	5%	1/16W
R680	1-216-833-11	METAL CHIP	10K	5%	1/16W
R681	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R682	1-216-821-11	METAL CHIP	1K	5%	1/16W
R683	1-216-811-11	METAL CHIP	150	5%	1/16W
R684	1-216-813-11	METAL CHIP	220	5%	1/16W
R686	1-216-814-11	METAL CHIP	270	5%	1/16W
R688	1-216-815-11	METAL CHIP	330	5%	1/16W
R690	1-216-833-11	METAL CHIP	10K	5%	1/16W
R691	1-216-838-11	METAL CHIP	27K	5%	1/16W
R692	1-216-833-11	METAL CHIP	10K	5%	1/16W
R693	1-216-820-11	METAL CHIP	820	5%	1/16W
R694	1-216-815-11	METAL CHIP	330	5%	1/16W
R695	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R696	1-216-818-11	METAL CHIP	560	5%	1/16W
R697	1-216-816-11	METAL CHIP	390	5%	1/16W
R698	1-216-833-11	METAL CHIP	10K	5%	1/16W
R700	1-216-833-11	METAL CHIP	10K	5%	1/16W
R701	1-216-833-11	METAL CHIP	10K	5%	1/16W
R703	1-216-833-11	METAL CHIP	10K	5%	1/16W
R704	1-216-838-11	METAL CHIP	27K	5%	1/16W
R705	1-216-821-11	METAL CHIP	1K	5%	1/16W
R707	1-216-833-11	METAL CHIP	10K	5%	1/16W
R709	1-216-841-11	METAL CHIP	47K	5%	1/16W
R710	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R711	1-216-836-11	METAL CHIP	18K	5%	1/16W
R712	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R713	1-216-841-11	METAL CHIP	47K	5%	1/16W
R714	1-216-841-11	METAL CHIP	47K	5%	1/16W
R715	1-216-841-11	METAL CHIP	47K	5%	1/16W
R716	1-216-039-00	METAL CHIP	390	5%	1/10W
R718	1-216-841-11	METAL CHIP	47K	5%	1/16W
R719	1-216-841-11	METAL CHIP	47K	5%	1/16W
R720	1-216-841-11	METAL CHIP	47K	5%	1/16W
R721	1-216-041-00	METAL CHIP	470	5%	1/10W
R723	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R724	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R725	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R726	1-216-817-11	METAL CHIP	470	5%	1/16W
R727	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R728	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R729	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R731	1-216-829-11	METAL CHIP	4.7K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R735	1-216-837-11	METAL CHIP	22K	5%	1/16W
R738	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R739	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R740	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R741	1-216-833-11	METAL CHIP	10K	5%	1/16W
R742	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R743	1-216-821-11	METAL CHIP	1K	5%	1/16W
R744	1-216-821-11	METAL CHIP	1K	5%	1/16W
R746	1-216-833-11	METAL CHIP	10K	5%	1/16W
R748	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R749	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R750	1-216-818-11	METAL CHIP	560	5%	1/16W
R751	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R752	1-216-833-11	METAL CHIP	10K	5%	1/16W
R753	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R754	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R755	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R756	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R757	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R758	1-216-845-11	METAL CHIP	100K	5%	1/16W
R759	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R760	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R762	1-216-845-11	METAL CHIP	100K	5%	1/16W
R763	1-216-845-11	METAL CHIP	100K	5%	1/16W
R764	1-216-845-11	METAL CHIP	100K	5%	1/16W
R766	1-216-821-11	METAL CHIP	1K	5%	1/16W
R767	1-216-821-11	METAL CHIP	1K	5%	1/16W
R768	1-216-821-11	METAL CHIP	1K	5%	1/16W
R769	1-216-817-11	METAL CHIP	470	5%	1/16W
R770	1-216-839-11	METAL CHIP	33K	5%	1/16W
R771	1-216-833-11	METAL CHIP	10K	5%	1/16W
R772	1-216-821-11	METAL CHIP	1K	5%	1/16W
R773	1-216-821-11	METAL CHIP	1K	5%	1/16W
R774	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R775	1-216-841-11	METAL CHIP	47K	5%	1/16W
R776	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R777	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R778	1-216-833-11	METAL CHIP	10K	5%	1/16W
R779	1-216-833-11	METAL CHIP	10K	5%	1/16W
R780	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R781	1-216-819-11	METAL CHIP	680	5%	1/16W
R782	1-216-837-11	METAL CHIP	22K	5%	1/16W
R783	1-216-837-11	METAL CHIP	22K	5%	1/16W
R784	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R785	1-216-821-11	METAL CHIP	1K	5%	1/16W
R787	1-216-841-11	METAL CHIP	47K	5%	1/16W
R788	1-216-837-11	METAL CHIP	22K	5%	1/16W
R789	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R790	1-216-821-11	METAL CHIP	1K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R791	1-216-833-11	METAL CHIP	10K	5%	1/16W
R792	1-216-833-11	METAL CHIP	10K	5%	1/16W
R793	1-216-815-11	METAL CHIP	330	5%	1/16W
R794	1-216-814-11	METAL CHIP	270	5%	1/16W
R795	1-216-811-11	METAL CHIP	150	5%	1/16W
R796	1-216-864-11	METAL CHIP	0		
R799	1-216-835-11	METAL CHIP	15K	5%	1/16W
R801	1-216-817-11	METAL CHIP	470	5%	1/16W
R802	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R803	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R804	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R805	1-216-833-11	METAL CHIP	10K	5%	1/16W
R807	1-216-833-11	METAL CHIP	10K	5%	1/16W
R808	1-216-818-11	METAL CHIP	560	5%	1/16W
R809	1-216-815-11	METAL CHIP	330	5%	1/16W
R810	1-216-820-11	METAL CHIP	820	5%	1/16W
R811	1-216-833-11	METAL CHIP	10K	5%	1/16W
R812	1-216-833-11	METAL CHIP	10K	5%	1/16W
R813	1-216-821-11	METAL CHIP	1K	5%	1/16W
R814	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R815	1-216-838-11	METAL CHIP	27K	5%	1/16W
R817	1-216-833-11	METAL CHIP	10K	5%	1/16W
R818	1-216-833-11	METAL CHIP	10K	5%	1/16W
R819	1-216-837-11	METAL CHIP	22K	5%	1/16W
R820	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R822	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R823	1-216-821-11	METAL CHIP	1K	5%	1/16W
R824	1-216-821-11	METAL CHIP	1K	5%	1/16W
R825	1-216-817-11	METAL CHIP	470	5%	1/16W
R826	1-216-809-11	METAL CHIP	100	5%	1/16W
R828	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R831	1-216-864-11	METAL CHIP	0		
R832	1-216-833-11	METAL CHIP	10K	5%	1/16W
R834	1-216-814-11	METAL CHIP	270	5%	1/16W
R835	1-216-814-11	METAL CHIP	270	5%	1/16W
R836	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R837	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R838	1-216-817-11	METAL CHIP	470	5%	1/16W
R839	1-216-817-11	METAL CHIP	470	5%	1/16W
R840	1-216-821-11	METAL CHIP	1K	5%	1/16W
R841	1-216-817-11	METAL CHIP	470	5%	1/16W
R844	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R845	1-216-841-11	METAL CHIP	47K	5%	1/16W
R846	1-216-833-11	METAL CHIP	10K	5%	1/16W
R847	1-216-837-11	METAL CHIP	22K	5%	1/16W
R848	1-216-821-11	METAL CHIP	1K	5%	1/16W
R849	1-216-809-11	METAL CHIP	100	5%	1/16W
R850	1-216-810-11	METAL CHIP	120	5%	1/16W
R851	1-216-825-11	METAL CHIP	2.2K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R852	1-216-821-11	METAL CHIP	1K	5%	1/16W
R854	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R856	1-216-833-11	METAL CHIP	10K	5%	1/16W
R857	1-216-833-11	METAL CHIP	10K	5%	1/16W
R858	1-216-864-11	METAL CHIP	0		
R859	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R860	1-216-838-11	METAL CHIP	27K	5%	1/16W
R861	1-216-841-11	METAL CHIP	47K	5%	1/16W
R862	1-216-834-11	METAL CHIP	12K	5%	1/16W
R863	1-216-834-11	METAL CHIP	12K	5%	1/16W
R865	1-216-816-11	METAL CHIP	390	5%	1/16W
R866	1-216-817-11	METAL CHIP	470	5%	1/16W
R869	1-216-857-11	METAL CHIP	1M	5%	1/16W
R870	1-216-810-11	METAL CHIP	120	5%	1/16W
R871	1-216-842-11	METAL CHIP	56K	5%	1/16W
R872	1-216-844-11	METAL CHIP	82K	5%	1/16W
R873	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R874	1-216-834-11	METAL CHIP	12K	5%	1/16W
R875	1-216-839-11	METAL CHIP	33K	5%	1/16W
R876	1-216-842-11	METAL CHIP	56K	5%	1/16W
R877	1-216-817-11	METAL CHIP	470	5%	1/16W
R878	1-216-821-11	METAL CHIP	1K	5%	1/16W
R879	1-216-821-11	METAL CHIP	1K	5%	1/16W
R880	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R881	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R882	1-216-821-11	METAL CHIP	1K	5%	1/16W
R883	1-216-821-11	METAL CHIP	1K	5%	1/16W
R884	1-216-841-11	METAL CHIP	47K	5%	1/16W
R885	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R886	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R887	1-216-857-11	METAL CHIP	1M	5%	1/16W
R888	1-216-810-11	METAL CHIP	120	5%	1/16W
R889	1-216-844-11	METAL CHIP	82K	5%	1/16W
R890	1-216-819-11	METAL CHIP	680	5%	1/16W
R892	1-216-839-11	METAL CHIP	33K	5%	1/16W
R893	1-216-842-11	METAL CHIP	56K	5%	1/16W
R894	1-216-817-11	METAL CHIP	470	5%	1/16W
R895	1-216-821-11	METAL CHIP	1K	5%	1/16W
R896	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R897	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R898	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R899	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R900	1-216-833-11	METAL CHIP	10K	5%	1/16W
R901	1-216-804-11	METAL CHIP	39	5%	1/16W
R902	1-216-804-11	METAL CHIP	39	5%	1/16W
R903	1-216-821-11	METAL CHIP	1K	5%	1/16W
R905	1-216-821-11	METAL CHIP	1K	5%	1/16W
R908	1-216-804-11	METAL CHIP	39	5%	1/16W
R909	1-216-804-11	METAL CHIP	39	5%	1/16W

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Ref. No.	Part No.	Description				Remark
R911	1-216-864-11	METAL CHIP	0			
R913	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R917	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R919	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R920	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R923	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R924	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R925	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R926	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R928	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R929	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R931	1-216-818-11	METAL CHIP	560	5%	1/16W	
R932	1-216-817-11	METAL CHIP	470	5%	1/16W	
R933	1-216-816-11	METAL CHIP	390	5%	1/16W	
R934	1-216-819-11	METAL CHIP	680	5%	1/16W	
R935	1-216-819-11	METAL CHIP	680	5%	1/16W	
R936	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R938	1-216-820-11	METAL CHIP	820	5%	1/16W	
R939	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R940	1-216-810-11	METAL CHIP	120	5%	1/16W	
R941	1-216-812-11	METAL CHIP	180	5%	1/16W	
R943	1-216-813-11	METAL CHIP	220	5%	1/16W	
R945	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R946	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W	
R947	1-218-706-11	METAL CHIP	3.9K	0.50%	1/16W	
R948	1-216-820-11	METAL CHIP	820	5%	1/16W	
R949	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R950	1-216-846-11	METAL CHIP	120K	5%	1/16W	
R951	1-218-704-11	METAL CHIP	3.3K	0.50%	1/16W	
R952	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W	
R953	1-218-688-11	METAL CHIP	680	0.50%	1/16W	
R954	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R955	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R956	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R957	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R958	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R959	1-216-817-11	METAL CHIP	470	5%	1/16W	
R960	1-216-037-00	METAL CHIP	330	5%	1/10W	
R961	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R962	1-216-804-11	METAL CHIP	39	5%	1/16W	
R963	1-216-804-11	METAL CHIP	39	5%	1/16W	
R965	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R970	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R971	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R972	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R973	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R974	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R975	1-216-813-11	METAL CHIP	220	5%	1/16W	
R977	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R979	1-216-816-11	METAL CHIP	390	5%	1/16W	
R981	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R983	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R984	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R985	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R986	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R987	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R989	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R992	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R994	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R995	1-216-820-11	METAL CHIP	820	5%	1/16W	
R996	1-216-812-11	METAL CHIP	180	5%	1/16W	

< VARIABLE RESISTOR >

RV416	1-238-092-11	RES, ADJ CERMET 47K
RV417	1-238-089-11	RES, ADJ CERMET 4.7K
RV650	1-238-091-11	RES, ADJ CERMET 22K
RV651	1-238-092-11	RES, ADJ CERMET 47K
RV652	1-238-091-11	RES, ADJ CERMET 22K
RV653	1-238-089-11	RES, ADJ CERMET 4.7K
RV654	1-238-089-11	RES, ADJ CERMET 4.7K
RV655	1-238-088-11	RES, ADJ CERMET 2.2K
RV656	1-238-091-11	RES, ADJ CERMET 22K
RV657	1-238-089-11	RES, ADJ CERMET 4.7K
RV658	1-238-090-11	RES, ADJ CERMET 10K
RV661	1-238-089-11	RES, ADJ CERMET 4.7K
RV662	1-238-087-11	RES, ADJ CERMET 1K
RV663	1-238-087-11	RES, ADJ CERMET 1K
RV664	1-238-087-11	RES, ADJ CERMET 1K
RV666	1-238-087-11	RES, ADJ CERMET 1K
RV686	1-238-087-11	RES, ADJ CERMET 1K

< FLEXIBLE BOARD >

W650	1-634-431-11	FP-260 FLEXIBLE BOARD

< CRYSTAL >

X650	1-577-117-21	VIBRATOR, CRYSTAL

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Ref. No.	Part No.	Description			Remark
	* A-7062-666-A	VC-67P BOARD, COMPLETE			
		**********************			
					(Ref. No 4,000 Series)
	* 3-744-763-01	CASE, SHIELD, VC			
		< CAPACITOR >			
C301	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C302	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C401	1-164-634-11	CERAMIC CHIP	1uF		16V
C402	1-164-634-11	CERAMIC CHIP	1uF		16V
C403	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C404	1-164-634-11	CERAMIC CHIP	1uF		16V
C406	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C407	1-164-634-11	CERAMIC CHIP	1uF		16V
C408	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C409	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C410	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C411	1-124-566-11	ELECT	120uF	20%	6.3V
C412	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C413	1-164-634-11	CERAMIC CHIP	1uF		16V
C414	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C415	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C416	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C417	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C419	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C420	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C501	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C502	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C503	1-164-634-11	CERAMIC CHIP	1uF		16V
C506	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C507	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C508	1-135-072-21	TANTALUM CHIP	0.22uF	10%	35V
C509	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C510	1-128-004-11	ELECT CHIP	10uF	20%	16V
C511	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C512	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C513	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C514	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C517	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C518	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C519	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C520	1-135-071-21	TANTALUM CHIP	0.15uF	10%	35V
C521	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C651	1-126-217-11	ELECT CHIP	15uF	20%	10V
C654	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C655	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C656	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C657	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C658	1-128-004-11	ELECT CHIP	10uF	20%	16V
C659	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C660	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C661	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C662	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C663	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C664	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C665	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C666	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C667	1-164-156-11	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN301	1-568-338-11	CONNECTOR, BOARD TO BOARD 24P			
CN302	1-568-331-11	CONNECTOR, BOARD TO BOARD 10P			
CN303	1-566-533-11	CONNECTOR, FPC (ZIF) 17P			
CN304	1-565-877-11	PIN, CONNECTOR (PC BOARD) 5P			
CN305	1-566-528-21	CONNECTOR, FPC (ZIF) 12P			
CN306	* 1-565-875-11	PIN, CONNECTOR (PC BOARD) 3P			
CN307	* 1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P			
CN308	* 1-565-541-11	PIN, CONNECTOR (PC BOARD) 2P			
CN651	* 1-566-187-11	PIN, CONNECTOR (PC BOARD) 8P			
CN652	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P			
CN653	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P			
CN654	* 1-565-529-21	PIN, CONNECTOR (PC BOARD) 4P			
CN655	1-565-530-11	PIN, CONNECTOR (PC BOARD) 5P			
		< DIODE >			
D501	8-719-404-46	DIODE	MA110		
D502	8-719-404-46	DIODE	MA110		
D503	8-719-404-46	DIODE	MA110		
D504	8-719-404-46	DIODE	MA110		
		< FILTER >			
FL301	1-236-759-21	FILTER, LOW PASS (TRAP)			
FL302	1-415-731-21	DELAY LINE, LC (YH)			
FL303	1-415-732-21	DELAY LINE, LC (200NS)			
FL401	1-415-763-21	DELAY LINE, LC			
FL402	1-415-730-21	DELAY LINE, LC (100NS)			
		< HIC BOARD >			
HIC301	A-7068-186-A	MX-10AP BOARD, COMPLETE (HIC)			
		< IC >			
IC301	8-759-946-00	IC	MB88341PFV		
IC401	8-752-038-XX	IC	CXA1392R		
IC501	8-759-038-38	IC	MC68HC11EPFU		
IC502	8-759-008-95	IC	MC14028BF		
IC504	8-759-946-00	IC	MB88341PFV		

Ref. No.	Part No.	Description		Remark
IC505	8-759-998-96	IC	LM324D	
IC507	8-759-030-74	IC	SC14S66F	
IC508	8-759-937-56	IC	S-8054ALB-LM-S	
IC509	8-759-008-67	IC	MC14066BF	
IC510	8-759-998-96	IC	LM324D	
IC651	8-759-981-82	IC	RC3414M	
IC652	8-759-037-20	IC	MPC1737M	
IC653	8-759-998-98	IC	LM358D	
IC655	8-759-300-71	IC	HD14053BFP	
IC656	8-759-998-96	IC	LM324D	
		< COIL >		
L401	1-410-391-11	INDUCTOR, CHIP 68uH		
L502	1-412-058-11	INDUCTOR, CHIP 10uH		
L503	1-412-062-11	INDUCTOR, CHIP 47uH		
		< TRANSISTOR >		
Q301	8-729-905-23	TRANSISTOR	2SA1576-R	
Q302	8-729-905-23	TRANSISTOR	2SA1576-R	
Q303	8-729-402-84	TRANSISTOR	XN4601	
Q401	8-729-402-84	TRANSISTOR	XN4601	
Q402	8-729-402-84	TRANSISTOR	XN4601	
Q403	8-729-905-23	TRANSISTOR	2SA1576-R	
Q404	8-729-905-35	TRANSISTOR	2SC4081-R	
Q501	8-729-420-50	TRANSISTOR	UN5215	
Q502	8-729-420-50	TRANSISTOR	UN5215	
Q503	8-729-420-50	TRANSISTOR	UN5215	
Q504	8-729-403-10	TRANSISTOR	XN6215	
Q505	8-729-403-10	TRANSISTOR	XN6215	
Q506	8-729-420-07	TRANSISTOR	XN6213	
Q507	8-729-420-50	TRANSISTOR	UN5215	
Q508	8-729-402-78	TRANSISTOR	XN6401	
Q509	8-729-403-10	TRANSISTOR	XN6215	
Q510	8-729-905-35	TRANSISTOR	2SC4081-R	
Q513	8-729-402-84	TRANSISTOR	XN4601	
Q514	8-729-905-35	TRANSISTOR	2SC4081-R	
Q515	8-729-402-84	TRANSISTOR	XN4601	
Q516	8-729-905-35	TRANSISTOR	2SC4081-R	
Q517	8-729-905-23	TRANSISTOR	2SA1576-R	
Q651	8-729-905-23	TRANSISTOR	2SA1576-R	
Q652	8-729-402-42	TRANSISTOR	UN5213	
Q653	8-729-106-60	TRANSISTOR	2SB1115A	
Q654	8-729-905-35	TRANSISTOR	2SC4081-R	
Q655	8-729-905-35	TRANSISTOR	2SC4081-R	
Q656	8-729-905-35	TRANSISTOR	2SC4081-R	
Q657	8-729-402-84	TRANSISTOR	XN4601	
Q658	8-729-402-84	TRANSISTOR	XN4601	

Ref. No.	Part No.	Description				Remark
		< RESISTOR >				
R301	1-216-864-11	METAL CHIP	0			
R302	1-216-820-11	METAL CHIP	820	5%	1/16W	
R304	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R307	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R311	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R312	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R313	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R314	1-216-864-11	METAL CHIP	0			
R316	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R317	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R318	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R321	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R325	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R327	1-216-864-11	METAL CHIP	0			
R328	1-216-864-11	METAL CHIP	0			
R329	1-216-817-11	METAL CHIP	470	5%	1/16W	
R401	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R403	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R404	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R405	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R406	1-216-864-11	METAL CHIP	0			
R407	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R410	1-216-864-11	METAL CHIP	0			
R414	1-216-864-11	METAL CHIP	0			
R415	1-216-820-11	METAL CHIP	820	5%	1/16W	
R416	1-216-817-11	METAL CHIP	470	5%	1/16W	
R417	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R418	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R419	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R420	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R421	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R422	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R427	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R428	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R429	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R432	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R435	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R437	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R440	1-216-295-00	METAL CHIP	0	5%	1/10W	
R501	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R502	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R503	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R504	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R506	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R508	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R509	1-216-833-11	METAL CHIP	10K	5%	1/16W	

Ref. No.	Part No.	Description			Remark
R510	1-216-833-11	METAL CHIP	10K	5%	1/16W
R511	1-216-833-11	METAL CHIP	10K	5%	1/16W
R513	1-216-845-11	METAL CHIP	100K	5%	1/16W
R514	1-216-833-11	METAL CHIP	10K	5%	1/16W
R515	1-216-857-11	METAL CHIP	1M	5%	1/16W
R517	1-216-833-11	METAL CHIP	10K	5%	1/16W
R518	1-216-833-11	METAL CHIP	10K	5%	1/16W
R519	1-216-833-11	METAL CHIP	10K	5%	1/16W
R520	1-216-833-11	METAL CHIP	10K	5%	1/16W
R521	1-216-833-11	METAL CHIP	10K	5%	1/16W
R522	1-216-833-11	METAL CHIP	10K	5%	1/16W
R523	1-216-840-11	METAL CHIP	39K	5%	1/16W
R524	1-216-833-11	METAL CHIP	10K	5%	1/16W
R525	1-216-833-11	METAL CHIP	10K	5%	1/16W
R526	1-216-847-11	METAL CHIP	150K	5%	1/16W
R527	1-216-845-11	METAL CHIP	100K	5%	1/16W
R528	1-216-833-11	METAL CHIP	10K	5%	1/16W
R529	1-216-845-11	METAL CHIP	100K	5%	1/16W
R530	1-216-845-11	METAL CHIP	100K	5%	1/16W
R531	1-216-833-11	METAL CHIP	10K	5%	1/16W
R532	1-216-833-11	METAL CHIP	10K	5%	1/16W
R533	1-216-833-11	METAL CHIP	10K	5%	1/16W
R534	1-216-837-11	METAL CHIP	22K	5%	1/16W
R535	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R536	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R537	1-216-845-11	METAL CHIP	100K	5%	1/16W
R546	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R547	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R550	1-216-833-11	METAL CHIP	10K	5%	1/16W
R551	1-216-833-11	METAL CHIP	10K	5%	1/16W
R552	1-216-833-11	METAL CHIP	10K	5%	1/16W
R553	1-216-685-11	METAL CHIP	27K	0.5%	1/10W
R554	1-216-842-11	METAL CHIP	56K	5%	1/16W
R555	1-216-336-11	METAL CHIP	47K	1%	1/10W
R556	1-216-833-11	METAL CHIP	10K	5%	1/16W
R557	1-216-844-11	METAL CHIP	82K	5%	1/16W
R560	1-216-833-11	METAL CHIP	10K	5%	1/16W
R562	1-216-833-11	METAL CHIP	10K	5%	1/16W
R649	1-216-309-00	METAL CHIP	5.6	5%	1/10W
R650	1-216-833-11	METAL CHIP	10K	5%	1/16W
R652	1-216-835-11	METAL CHIP	15K	5%	1/16W
R653	1-216-835-11	METAL CHIP	15K	5%	1/16W
R654	1-216-843-11	METAL CHIP	68K	5%	1/16W
R655	1-216-834-11	METAL CHIP	12K	5%	1/16W
R656	1-216-134-00	METAL CHIP	2.2	5%	1/8W
R657	1-216-833-11	METAL CHIP	10K	5%	1/16W
R658	1-216-835-11	METAL CHIP	15K	5%	1/16W
R659	1-216-821-11	METAL CHIP	1K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R660	1-216-836-11	METAL CHIP	18K	5%	1/16W
R661	1-216-821-11	METAL CHIP	1K	5%	1/16W
R662	1-216-815-11	METAL CHIP	330	5%	1/16W
R663	1-216-864-11	METAL CHIP	0		
R664	1-216-821-11	METAL CHIP	1K	5%	1/16W
R665	1-216-821-11	METAL CHIP	1K	5%	1/16W
R666	1-216-847-11	METAL CHIP	150K	5%	1/16W
R667	1-216-847-11	METAL CHIP	150K	5%	1/16W
R668	1-216-833-11	METAL CHIP	10K	5%	1/16W
R669	1-216-841-11	METAL CHIP	47K	5%	1/16W
R670	1-216-807-11	METAL CHIP	68	5%	1/16W
R672	1-216-864-11	METAL CHIP	0		
R676	1-216-864-11	METAL CHIP	0		
R678	1-216-864-11	METAL CHIP	0		
R679	1-216-837-11	METAL CHIP	22K	5%	1/16W
R680	1-216-833-11	METAL CHIP	10K	5%	1/16W
R681	1-216-817-11	METAL CHIP	470	5%	1/16W
R682	1-216-833-11	METAL CHIP	10K	5%	1/16W
R683	1-216-857-11	METAL CHIP	1M	5%	1/16W
R684	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R685	1-216-847-11	METAL CHIP	150K	5%	1/16W
R686	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R687	1-216-833-11	METAL CHIP	10K	5%	1/16W
R688	1-216-841-11	METAL CHIP	47K	5%	1/16W
R689	1-216-843-11	METAL CHIP	68K	5%	1/16W
R690	1-216-839-11	METAL CHIP	33K	5%	1/16W
R691	1-216-849-11	METAL CHIP	220K	5%	1/16W
R692	1-216-833-11	METAL CHIP	10K	5%	1/16W
R694	1-216-847-11	METAL CHIP	150K	5%	1/16W
R695	1-216-844-11	METAL CHIP	82K	5%	1/16W
R698	1-216-837-11	METAL CHIP	22K	5%	1/16W
R699	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R700	1-216-854-11	METAL CHIP	560K	5%	1/16W

< CRYSTAL >

Ref. No.	Part No.	Description			Remark
X501	1-578-689-21	VIBRATOR			

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VF-26

Ref. No.	Part No.	Description	Remark
*	A-7062-278-A	VF-26 BOARD, COMPLETE ********************** (Ref. No 8,000 Series)	

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C901	1-126-369-11	ELECT 220uF 20% 6.3V	
C902	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C904	1-127-515-11	ELECT(SOLID) 47uF 20% 6.3V	
C905	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C906	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C907 ⚠·	1-162-625-11	CERAMIC CHIP 0.0047uF 5% 50V	
C908 ⚠·	1-164-182-11	CERAMIC CHIP 0.0033uF 10% 50V	
C909	1-126-193-11	ELECT 1uF 20% 50V	
C911	1-131-388-00	TANTALUM 68uF 10% 6.3V	
C912	1-102-038-00	CERAMIC 0.001uF	
C913	1-163-033-00	CERAMIC CHIP 0.022uF 50V	
C915	1-126-193-11	ELECT 1uF 20% 50V	
C916	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	(TYPE 1)
C916	1-163-145-00	CERAMIC CHIP 0.0015uF 5% 50V	(TYPE 2)
C917	1-135-162-21	TANTALUM CHIP 33uF 20% 6.3V	(TYPE 2)
C917	1-135-166-21	TANTALUM CHIP 47uF 10% 10V	(TYPE 1)
C918	1-162-638-11	CERAMIC CHIP 1uF 16V	
C919	1-135-070-00	TANTALUM CHIP 0.1uF 10% 35V	
C920	1-164-232-11	CERAMIC CHIP 0.01uF 50V	

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN901 *	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN902 *	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN904	1-575-570-21	CONNECTOR, FPC/FFC 6P	

< CONPOSITION CIRCUIT BLOCK >

Ref. No.	Part No.	Description	Remark
CP901	1-238-119-11	RES, ADJ	

< SOCKET ASSY >

Ref. No.	Part No.	Description	Remark
CRT901	1-526-978-21	SOCKET ASSY, CRT	

< DIODE >

Ref. No.	Part No.	Description	Remark
D903	8-719-400-20	DIODE MA152WA	
D955	8-719-404-19	DIODE LN1251C	

< IC >

Ref. No.	Part No.	Description	Remark
IC901	8-759-420-01	IC AN2512S	(TYPE 1)
IC901	8-759-511-01	IC BA7147F	(TYPE 2)
IC901	8-759-514-92	IC XRA7147F	(TYPE 2)

< COIL >

Ref. No.	Part No.	Description	Remark
L901	1-410-645-31	INDUCTOR 100uH	
L902	1-410-385-11	INDUCTOR CHIP 22uH	
L903 ⚠·	1-459-858-11	COIL, FERRITE (HLC)	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q903	8-729-106-68	TRANSISTOR 2SD1615-AGP	
Q904	8-729-216-31	TRANSISTOR 2SA1163G	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R902	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	(TYPE 1)
R903	1-216-041-00	METAL CHIP 470 5% 1/10W	
R907	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R908	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R909	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R911	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R914	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R915	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R916	1-216-125-00	METAL CHIP 1.5M 5% 1/10W	
R917	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R919	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R920	1-216-111-00	METAL CHIP 390K 5% 1/10W	(TYPE 2)
R920	1-216-113-00	METAL CHIP 470K 5% 1/10W	(TYPE 1)
R921	1-216-011-00	METAL CHIP 27 5% 1/10W	(TYPE 2)
R921	1-216-013-00	METAL CHIP 33 5% 1/10W	
R922	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R923	1-216-025-00	METAL CHIP 100 5% 1/10W	
R924	1-216-306-11	METAL CHIP 3.9 5% 1/10W	
R925	1-216-334-11	METAL GLAZE 22K 1% 1/10W	(TYPE 2)
R925	1-216-336-11	METAL CHIP 47K 1% 1/10W	(TYPE 1)
R926	1-216-107-00	METAL CHIP 270K 5% 1/10W	(TYPE 1)
R926	1-218-165-11	METAL GLAZE 220K 1% 1/10W	(TYPE 2)
R928	1-216-870-11	METAL CHIP 180K 1% 1/10W	
R929	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	(TYPE 1)
R929	1-216-073-00	METAL CHIP 10K 5% 1/10W	(TYPE 2)
R930	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R931	1-216-121-00	METAL CHIP 1M 5% 1/10W	(TYPY 1)
R950	1-216-041-00	METAL CHIP 470 5% 1/10W	
R951	1-216-295-00	METAL CHIP 0 5% 1/10W	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV901	1-238-647-11	RES, ADJ, METAL GLAZE 4.7M	

< TRANSFORMER >

Ref. No.	Part No.	Description	Remark
T901 ⚠·	1-439-428-11	TRANSFORMER ASSY, FLYBACK	

< THERMISTOR >

Ref. No.	Part No.	Description	Remark
TH901	1-807-938-11	THERMISTOR	

****

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Part No.	Description	Remark
8-835-331-01	MOTOR, DC U-22A (CAPSTAN)	
A-7040-208-A	MOTOR ASSY, THREADING	
1-572-298-11	SWITCH, PUSH	
1-571-099-11	SWITCH	
1-546-085-11	CATHODE-RAY TUBE, B/W (M01KGG007WB)	
-452-482-11	CRT ASSY (M91JYZ60WB)	

****

ACCESSORY & PACKING MATERIAL
****

Part No.	Description	Remark
65-588-41	REMOTE COMMANDER (RMT-503)	
5-334-11	CORD, CONNECTION	
5-335-21	CORD, CONNECTION	
0-514-01	BAG, PROTECTION	
-160-11	MANUAL, INSTRUCTION (AEP, UK) (ENGLISH)	
760-41	MANUAL, INSTRUCTION (AEP) (FRENCH, GERMAN, SPANISH)	
0-51	MANUAL, INSTRUCTION (AEP) (DUTCH, SWEDISH, ITALIAN)	
-61	MANUAL, INSTRUCTION (AEP) (PORTUGUESE)	
-71	MANUAL, INSTRUCTION (AEP) (FINNISH, DANISH)	
-01	CUSHION (UPPER)	
01	CUSHION (LOWER)	
1	INDIVIDUAL CARTON	

****

RDWARE LIST
****

Part No.	Description	Remark
	SCREW +P X3	
	CREW +P X2	
	RECISION SCREW +P 2X2.2 TYPE3	
	CREW (M1.4X1.8)	
	CREW +BVTT 2X4 (S)	
	CREW, PRECISION +P 2X6 TYPE3	
	APE, POLYESTER (#630) (6MMX30M)	
	EEL BALL 3.0	
	PT PWH (2X5)	

****

nents identified by mark ⚠ or dotted
rk ⚠ are critical for safety.
y with part number specified.

Ref. No.	Part No.	Description				Remark
*	A-7062-279-A	VF-27 BOARD, COMPLETE				
		**********************				
		(Ref. No 9,000 Series)				
		< CAPACITOR >				
C901	1-124-442-00	ELECT	330uF	20%	6.3V	
C903	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C904	1-126-160-11	ELECT	1uF	20%	50V	
C905	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	
C906	1-131-381-00	TANTALUM	47uF	10%	10V	
C907	1-162-638-11	CERAMIC CHIP	1uF		16V	
C908	1-136-165-00	FILM	0.1uF	5%	50V	
C909	1-163-109-00	CERAMIC CHIP	47PF	5%	50V	
C910	1-124-587-11	ELECT	220uF	20%	6.3V	
C911	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V	
C912 ⚠·	1-162-625-11	CERAMIC CHIP	0.0047uF	5%	50V	
C913 ⚠·	1-162-625-11	CERAMIC CHIP	0.0047uF	5%	50V	
C914 ⚠·	1-163-209-00	CERAMIC CHIP	0.0015uF	5%	50V	
C915	1-126-090-11	ELECT	82uF	20%	10V	
C916	1-126-163-11	ELECT	4.7uF	20%	50V	
C918	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	
C919	1-102-038-00	CERAMIC	0.001uF			
		< CONNECTOR >				
CN902 *	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P				
CN903 *	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P				
CN904	1-575-570-21	CONNECTOR, FPC/FFC 6P				
		< DIODE >				
D903	8-719-400-20	DIODE MA152WA				
D955	8-719-404-19	DIODE LN1251C				
		< IC >				
IC901	8-759-420-01	IC AN2512S				
		< COIL >				
L901	1-410-831-21	INDUCTOR 82uH				
L902	1-408-977-21	INDUCTOR 39uH				
L903 ⚠·	1-459-858-11	COIL, FERRITE (HLC)				
		< TRANSISTOR >				
Q903	8-729-216-31	TRANSISTOR 2SA1163G				
Q904	8-729-100-66	TRANSISTOR 2SC1623				
Q905	8-729-106-68	TRANSISTOR 2SD1615-AGP				
		< RESISTOR >				
R903	1-216-041-00	METAL CHIP	470	5%	1/10W	
R905	1-216-007-00	METAL CHIP	18	5%	1/10W	
R906	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R908	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R909	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R910	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R911	1-216-013-00	METAL CHIP	33	5%	1/10W	
R912	1-216-691-11	METAL CHIP	47K	0.5%	1/10W	
R913	1-216-107-00	METAL CHIP	270K	5%	1/10W	
R914	1-216-025-00	METAL CHIP	100	5%	1/10W	
R915	1-216-306-11	METAL CHIP	3.9	5%	1/10W	
R917	1-216-045-00	METAL CHIP	680	5%	1/10W	
R918	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R919	1-216-748-11	METAL CHIP	39K	5%	1/10W	
R920	1-216-748-11	METAL CHIP	39K	5%	1/10W	
R921	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R922	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R923	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R924	1-216-131-11	METAL CHIP	2.7M	5%	1/10W	
R925	1-216-131-11	METAL CHIP	2.7M	5%	1/10W	
R926	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R928	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R933	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R950	1-216-041-00	METAL CHIP	470	5%	1/10W	
		< VARIABLE RESISTOR >				
RV901	1-230-873-11	RES, ADJ, METAL 47K				
RV902	1-230-866-11	RES, ADJ, METAL 470				
RV903	1-230-869-11	RES, ADJ, METAL 4.7K				
RV904	1-228-762-00	RES, ADJ, METAL GLAZE 1M				
		< TRANSFORMER >				
T901 ⚠·	1-439-431-11	TRANSFORMER ASSY, FLYBACK				
		< THERMISTOR >				
TH901	1-807-938-11	THERMISTOR				
		< SOCKET ASSY >				
W901	1-540-019-21	SOCKET ASSY, CRT				

****

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
	1-628-060-12	FP-89 FLEXIBLE BOARD	
		********************	
	1-571-664-11	SWITCH, SLIDE (ENCODER)	
	3-728-869-02	HOLDER, SENSOR	
		< DIODE >	
D301	8-719-801-55	DIODE TLP907-0	
		< TRANSISTOR >	
Q301	8-729-906-48	TRANSISTOR EE-TP109	
		< SWITCH >	
S903	1-571-099-11	SWITCH (CASSETTE DOWN)	

****

Ref. No.	Part No.	Description	Remark
	1-628-061-12	FP-90 FLEXIBLE BOARD	
		********************	
	3-728-837-01	LED HOLDER	
	3-728-869-02	HOLDER, SENSOR	
		< DIODE >	
D302	8-719-801-55	DIODE TLP907-0	
D303	8-719-940-81	DIODE GL-452S	
		< TRANSISTOR >	
Q302	8-729-906-48	TRANSISTOR EE-TP109	
		< SWITCH >	
S302	1-571-680-11	PUSH, SWITCH (3 KEY)	

****

MISCELLANEOUS

****

Ref. No.	Part No.	Description	Remark
120	1-572-320-31	SWITCH, PUSH	
129	1-542-150-11	MICROPHONE, STEREO	
228	1-569-346-11	CONNECTOR, FPC (TRANSLATION) 10P	
229	1-569-347-11	CONNECTOR, FPC (TRANSLATION) 13P	
263	1-808-505-12	SENSOR (DEN)	
407	1-547-381-12	FILTER BLOCK, OPTICAL (OFB-02-03)	
415 ⚠·	1-466-230-21	CONVERTER UNIT, D/D	
451	1-547-421-11	LENS, ZOOM (VCL-810XA)	
IC101	8-752-604-72	IC ICX039AN-2 (CCD IMAGER) (Note 1)	
L901-1⚠·	1-451-310-21	DEFLECTION YOKE (B/W)	
M902	8-835-331-01	MOTOR, DC U-22A (CAPSTAN)	
M903	A-7040-208-A	MOTOR ASSY, THREADING	
S302	1-572-298-11	SWITCH, PUSH	
S901	1-571-099-11	SWITCH	
V901-1⚠·	1-546-085-11	CATHODE-RAY TUBE, B/W (M01KGG007WB)	
V901-2⚠·	1-452-482-11	CRT ASSY (M91JYZ60WB)	

****

ACCESSORY & PACKING MATERIAL

****

Ref. No.	Part No.	Description	Remark
	1-465-588-41	REMOTE COMMANDER (RMT-503)	
	1-575-334-11	CORD, CONNECTION	
*	1-575-335-21	CORD, CONNECTION	
*	3-340-514-01	BAG, PROTECTION	
	3-752-160-11	MANUAL, INSTRUCTION (AEP, UK) (ENGLISH)	
	3-752-160-41	MANUAL, INSTRUCTION (AEP) (FRENCH, GERMAN, SPANISH)	
	3-752-160-51	MANUAL, INSTRUCTION (AEP) (DUTCH, SWEDISH, ITALIAN)	
	3-752-160-61	MANUAL, INSTRUCTION (AEP) (PORTUGUESE)	
	3-752-160-71	MANUAL, INSTRUCTION (AEP) (FINNISH, DANISH)	
*	3-940-116-01	CUSHION (UPPER)	
*	3-940-117-01	CUSHION (LOWER)	
*	3-940-119-11	INDIVIDUAL CARTON	

****

HARDWARE LIST

****

# 1	7-621-255-15	SCREW +P 2X3
# 2	7-621-281-15	SCREW +P 2X2
# 3	7-627-554-07	PRECISION SCREW +P 2X2.2 TYPE3
# 4	7-627-555-88	SCREW (M1.4X1.8)
# 5	7-621-255-25	SCREW +BVTT 2X4 (S)
# 6	7-627-553-68	SCREW, PRECISION +P 2X6 TYPE3
# 7	7-632-701-38	TAPE, POLYESTER (#630) (6MMX30M)
# 8	7-671-155-01	STEEL BALL 3.0
# 9	7-685-103-19	+ PTPWH (2X5)

****

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

CCD-V800E
RMT-503

SONY®
SERVICE MANUAL

AEP Model
UK Model

SUPPLEMENT-1

● **ADJUSTMENT**

File this supplement-1 with the service manual.

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The colour reproduction standard frame is contained after the adjustment elements location of camera adjustment parts.

SECTION 1
SERVICE MODE

☆This unit adopts the camera adjustment and the EVR (Electronic Variable resistor) with the SENSER LANC system.

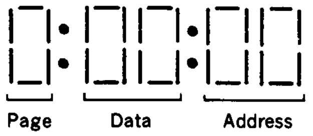
<SENSER LANC>
SENSER LANC is the LANC format to adjust the EVR (Electronic Variable resistor) of Video 8 Handycam and to perform tests by using the LANC (control L). This word stands for the same as the SERVICE LANC formerly used, however, the unified word "SENSER LANC" will be used with this substantial functions.

1-1. HOW TO USE RM-95 JIG (REMOTE CONTROL FOR ADJUSTMENT)

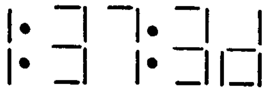
RM-95 jig is used to operate the SENSER LANC. HOLD switch of this jig is remodelled for service to get the SENSER LANC mode. Replacing microcomputer in RM-95 is required for the old-model RM-95 jig, which has no page display function.

Old model	μPD7503G-A71-12 μPD7503G-C23-12	8-759-142-56 8-759-146-77	Page is not displayed (Replacing microcomputer is required)
New model	μPD7503G-C56-12	8-759-148-35	Page is displayed

LCD display of RM-95



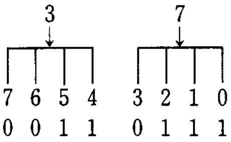
⇨ Example



This means that the page 1 and address 3D is data of 37.

- Reference between Data and Bit

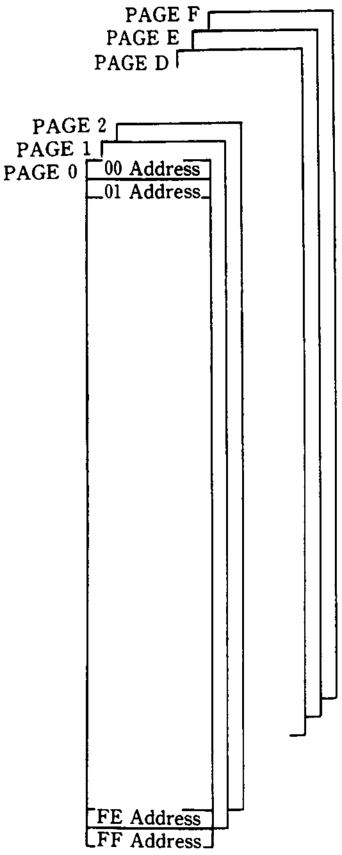
When the data is 37 ⇨ Bit



Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3D	MP-HG		ME/MP	REC PROOF	V MUTE	A MUTE	JOG	VA PB MODE
		0	0	1	1	0	1	1	1

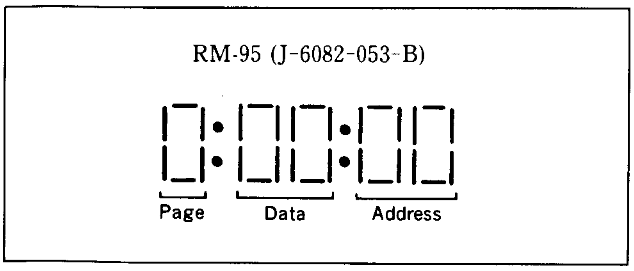
The data in the above list means as follows:
ME SW..............ON
REC PROOF SW ....ON
Audio mute ....ON
JOG...................ON
VA PB MODE........ON

1-1-1. SENSER LANC Memory Map

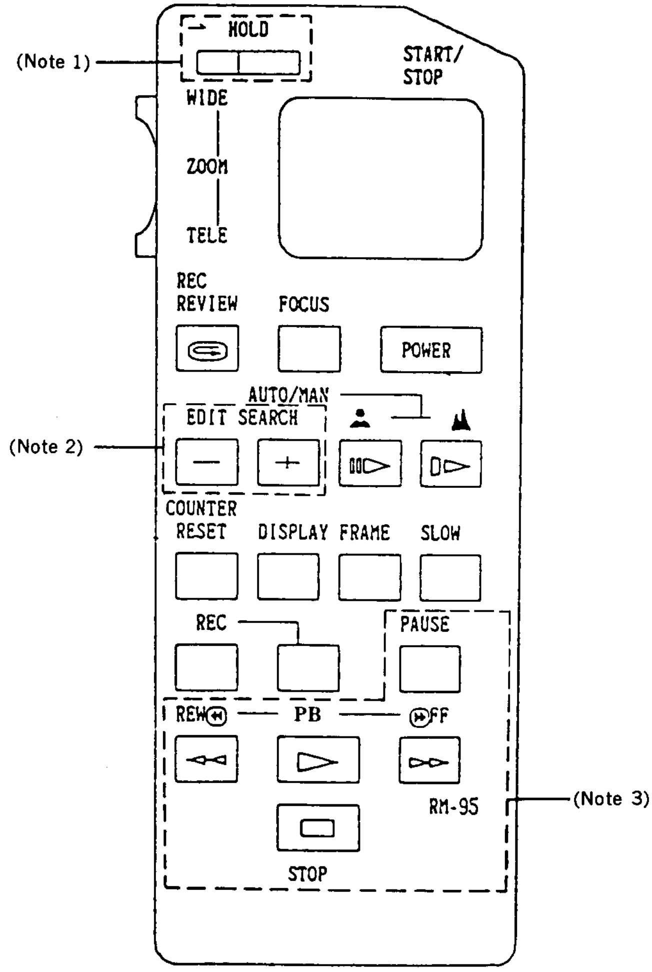


PAGE	Page allocation	Description
0	Service	
1	Mode Control RAM	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2	Mode Control I/O	
3	Mechanical Control RAM	RAM and I/O memory area of the mechanical controller.
4	Mode Control I/O	
5	Camera microcompuler RAM	RAM and I/O memory area of the camera micro controller.
6	Camera microcompuler I/O	
7	Spare	
8	Spare	
9	Spare	
A	Spare	
B	Spare	
C	Spare	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is tuned off. Releasing protect is required for changing data.
E	Camera EE-PROM2	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is tuned off.
F	Camera EE-PROM1	

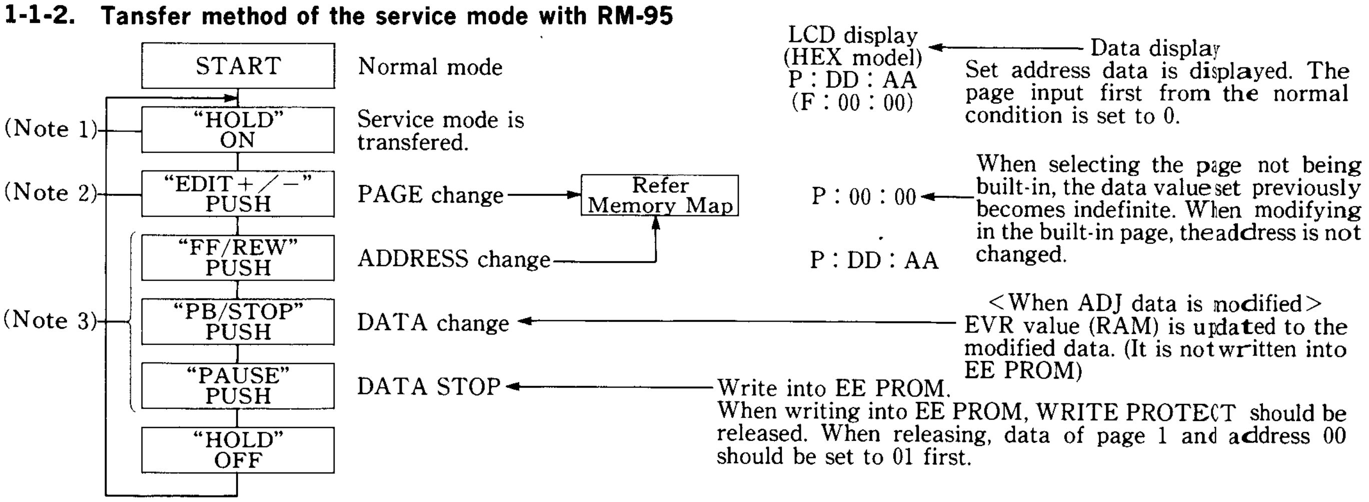
Note) There are 16 types of page from 0 to F. The allocation of page is as the above list. Only the memory of page D, E and F is not erased when the power is turned off as the EVR (Electronic Variable resistor).


RM-95 (J-6082-053-B)
0.00.00
Page
Data
Address

RM-95 (J-6082-053-B)


HOLD
(Note 1)
START/STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
AUTO/MAN
EDIT SEARCH
(Note 2)
COUNTER RESET
DISPLAY
FRAME
SLOW
REC
PAUSE
REW
PB
FF
RM-95
(Note 3)
STOP

1-1-2. Tansfer method of the service mode with RM-95


START
(Note 1)
"HOLD" ON
(Note 2)
"EDIT+/−" PUSH
"FF/REW" PUSH
(Note 3)
"PB/STOP" PUSH
"PAUSE" PUSH
"HOLD" OFF
Normal mode
Service mode is transfered.
PAGE change
Refer Memory Map
ADDRESS change
DATA change
DATA STOP
LCD display (HEX model) P : DD : AA (F : 00 : 00)
P : 00 : 00
P : DD : AA

Data display
Set address data is displayed. The page input first from the normal condition is set to 0.

When selecting the page not being built-in, the data value set previously becomes indefinite. When modifying in the built-in page, the address is not changed.

<When ADJ data is modified>
EVR value (RAM) is updated to the modified data. (It is not written into EE PROM)

Write into EE PROM.
When writing into EE PROM, WRITE PROTECT should be released. When releasing, data of page 1 and address 00 should be set to 01 first.

Command name	Command function	Function Button with RM-95
Page Up	Page+ 1	Edit Search+
Page Down	Page− 1	Edit Search−
Direct Page Set	Set to direct page	Event Clear
Address Up	Address+1	Fast Forward
Address Down	Address−1	Rewind
Data Up	Data+ 1	Play Back
Data Down	Data−1	Stop
Store	Write data into EEPROM. RAM	Pause

1-1-3. ADJUST, TEST MODE description

MODE		PAGE/DATA/ADDRESS	Contents
ADJUST	Switching Position Adjustment	d : -- : 04 (high) d : -- : 05 (low)	Switching position adjustment See to page 61 for details
	Battery Down Adjustment	d : -- : 06 (Sensor value) d : -- : 07 (Set value)	Use for battery down adjustment See to page 60 for details
TEST MODE	Pass Adjustment Truck Shift	1 : 30 : 4D	Truck shift for pass adjustment Set to the data described left and set the playback mode.
	Emergency Inhibit	1 : 10 : 4D	Detection of emergency is inhibited. Even if battery is ended, power is not turned off. SP/LP is not automatically distinguished. Emergency detection except for TAPE/TOP•END is inhibited.
	Emergency Code	D : -- : 20~22 D : -- : 24~26	First emergency is displayed. Last emergency is displayed. (※ See to 1) (IC501 μPD75312GF-018 and 024 are not displayed.)
	RECOG SW Check	1 : -- : 3D 1 : -- : 3E	Mode switch position is displayed. RECOG SW ON OFF is displayed. (※ See to 2)
	Function SW Check	1 : -- : E8~ED	Pressing KEY is checked. (※ See to 3)
	Motor single check	3 : 10 : DD (Loading Ⓜ) 3 : 11 : DD (Drum Ⓜ) 3 : 12 : DD (Capstan Ⓜ)	Rotating in right direction, inverting, stopping of each motor can be separately controlled. • Loading Motor • Drum Motor (※ See to 4) • Capstan Motor
	Sensor check	3 : 21 : DD	The following sensor is input by performing A/D selecting, and the A/D selecting value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction DEW sensor. (※ See to 5)
	Reception contents check of wireless remote control	1 : -- : 1E and 1D	The received code contents of the remote control code can be confirmed. (※ See to 6)

※1 Emergency Code Check

With the SENSER LANC (The emergency code has the first emergency and last emergency. The last emergency side is changed when emergency is generated ; the first emergency side records the only code generated first.)

			First	Last	
Page	D	Address	20, 21	24, 25	← Emergency code
Page	D	Address	22	26	← Mode when emergency is generated

Displayed → Be sure to rewrite the address from 20 to 26 to data 00 after the operation.

(1) Emergency code list

Code		Emergency contents
20H,24H	21H,25H	
00	00	Normal mode
01	00	Loading Motor emergency.
02	00	Unloading, Reel emergency.
04	00	Steady, Reel emergency.
08	00	Capstan emergency.
00	01	Drum steady, FG emergency.
00	02	Drum steady, PG emergency.
00	21	Drum steady, FG emergency.
00	22	Drum steady, PG emergency.
00	41	Loading, Drum FG emergency.
00	42	Loading, Drum PG emergency.
00	81	Unloading, Drum FG emergency.
00	82	Unloading, Drum PG emergency.
——	——	Dram steady Phase emergency.

- In order to delete the contents of 〔the first and the last emergency〕, write with SENSOR LANC as follows.

Page 1	Address 00	Data 01

After that, write data 00 into each address. After writing, return to

Page 1	Address 00	Data 00

(2) Mode code

Mode	Code	Mode	Code
STOP	20	EDIT S CUE	5A
FF	30	EDIT S REV	5B
REW	38	EDIT S STIL	5F
PB	60	+×1	62
CUE	64	−×1	63
REV	65	−STILL	79
STILL	70	+FRAME	76
REC	40	−FRAME	77
REC. P	41	+×2	66
SHUTTLE EDIT (+)	5A	−×2	62
SHUTTLE EDIT (−)	5B	LOADING	21
CAM STBY	41	UNLOADING	13
CAM REC	40	EJECTED	10
REC REV+	58	+SLOW	72
REC REV−	59	−SLOW	73

Note : Pay attention that the above codes are displayed in the reverse order when FD-15P board IC201 μPD75312GF-018 and 024 are mounted.
Example) PB 06

※ 2 RECOG SW Check

With the SENSER LANC

Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3D	MP-HG		ME/MP	REC PROOF	V MUTE	A MUTE	JOG	VA PB MODE

"1"=REC inhibit

"1"=ME/ 0 : MP

"1"=MPHG/ 0 : Normal

Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3E	DEW			RP PB MODE	CASSETTE CONTROLLER LOCK	MODE SW2	MODE SW1	MODE SW0

See to the following list

When locking the cassette controller, "1"

- MODE SW CODE LIST

	Address 3E contents			Real port condition			Remark
Position	M SW2	M SW1	M SW0	M SW2	M SW1	M SW0	
EJECT	0	0	0	L	H	H	Cassette controller eject position
IA	0	0	1	H	H	H	Interval A
UNLOAD	0	1	0	L	L	H	Normal EJECT unloaded
IB	0	1	1	H	L	H	Interval B
STOP	1	0	0	H	L	L	STOP mode position
IC	1	0	1	H	H	L	Interval C
FWD	1	1	0	L	H	L	Pinch pressure welded
ID	1	1	1	L	L	L	Interval D
SHAKING HEAD POSITION	0	0	0	L	H	L	Shaking head position

☆ This mode releasing is turn off the SENSER LANC.

※ **3 Switch check** (See to the previous page for reading code.)

With the SENSER LANC :

Page 1	Address E8 to ED	Data Refer to table

Address	Bit 7 K IN 7	Bit 6 K IN 6	Bit 5 K IN 5	Bit 4 K IN 4	Bit 3 K IN 3	Bit 2 K IN 2	Bit 1 K IN 1	Bit 0 K IN 0
E 8 K OUT 0	GAIN	COSTROL UP	PAUSE	REC	PLAY	REW	FF	STOP
E 9 K OUT 1	SHUTTER	CONTROL DOWN	SLOW	FRAME /RVS	INDEX MARK	MENU ▼	DATA SCREEN	VTR
EA K OUT 2	PUSH AUTO	FOCUS	FRAME /FWD	MENU EXEC	MENU	MENU ◀	MENU ▶	CAM
EB K OUT 3	WB	WB	PROGRAM AE	FADER	ZERO MENU	RVS	EDIT CUE	STBY
EC K OUT 4	—	TIME	DATE	EJECT	—	—	COUNTER RESET	START /STOP
ED K OUT 5	COLOR	MERORY	TITLE2	TITLE1	IRIS	—	—	AUTO LOCK

☆ This mode releasing is turn off the SENSER LANC.

- Check the initial set value in shipping after the service, because EE PROM is monuted to VTR in this unit.

D Page Initial set value in shipping (for this unit)

Address	Contents					Set value
0 0 0	Aging mode					00
0 0 1	Each flag area (destination/model /HEAD widthl × 2MUTE)					9A
0 0 2	VTR REC key acceptance authorization					00
0 0 3						--
0 0 4	Switching position (low)					Adjustment value
0 0 5	Switching position (high)					Adjustment value
0 0 6	Battery A/D modification value					Adjustment value
0 0 7	Battery end set area					Adjustment value
0 1 0	SR data storage area	EDIT OFF	MP	HI8	LP	5F
0 1 1	SR data storage area	EDIT OFF	MP	HI8	SP	65
0 1 2	SR data storage area	EDIT OFF	MP	NOR	LP	58
0 1 3	SR data storage area	EDIT OFF	MP	NOR	SP	68
0 1 4	SR data storage area	EDIT OFF	ME	HI8	LP	55
0 1 5	SR data storage area	EDIT OFF	ME	HI8	SP	69
0 1 6	SR data storage area	EDIT OFF	ME	NOR	LP	5C
0 1 7	SR data storage area	EDIT OFF	ME	NOR	SP	68
0 1 8	Titler vertical position adjustment area JOG mode					0C
0 1 9	Titler vertical position adjustment area NOR mode					06
0 1 A	Titler horizontal position adjustment area playback mode					DD
0 1 B	Titler horizontal position adjustment area EE mode					DB
0 1 C	When SR data storage area EDIT is ON : Hi8 mode					65
0 1 D	When SR data storage area EDIT is ON : Normal mode					5C
0 1 E						--
0 1 F						--
0 2 0	First generated emergency code (low) (First emergecy)					00
0 2 1	First generated emergency code (high) (First emergency)					00
0 2 2	Mode code when emergency is generated first					00
0 2 3						00
0 2 4	Last generated emergency code (low) (Last emergency)					00
0 2 5	Last generated emergency code (high) (Last emergency)					00
0 2 6	Mode code when emergency is generated last.					00

※ 4 In order to operate the motor singly

[Operation]

Write the following number with the SENSER LANC into | Page 3 | Address DD. |

Then the check of each motor is performed.

10H → Loading motor
11H → Drum motor
12H → Capstan motor

After the set of the above data, operation is performed by pressing the following keys. (When the operation is performed with RM-95, set the HOLD switch to left and release the SENSER LANC.)

FF key → Rotating in right direction
REW key → Inverting
STOP key → Stop

Note) In this mode, operation is only performed on the normally loaded condition.

Note) The motor rotating speed is the normal rotating number. (Drum 30Hz, Capstan SP mode speed, Loading normal speed).

In order to release this mode, turn off the SENSER LANC and turn off the power.

※ 5 In order to read the A/D selecting value (Senser check)

[Operation]

With the SENSER LANC:

Write | Page 3 | Address DD | Data 21 |

The following address (PAGE 3) of the A/D selecting value of each A/D port is displayed.

Address	Selecting value Contents
65	TOP sensor (light ON)
67	TOP sensor (light OFF)
64	END sensor (light ON)
66	END sensor (light OFF)
62	S-REEL FG
63	T-REEL FG
60	Thermistor (for SWP correction)
5F	DEW sensor

The voltage of A/D selecting 1 step: 4.9÷256≒19mV

※ 6 In order to check the reception contents of the wireless remote control

With SENSER LANC, the received remote control code is displayed to | Page 1 | Address 1E. |

The remote control code is only displayed while the code which the LANC code is shifted to right for 1 bit is pressed, and FF is displayed when the code is released.

The received category code of the remote control is displayed to the upper 4 bit of | Page 1 | Address 1D. |

(The description of the remote control code is omitted in this chart.)

1-1-4. How to use practically

How to use:

How to set the adjustment mode and the TEST mode

Set RM-95 to the service mode.

How to change and write data

Press the PAUSE button of RM-95. Pressing PAUSE button is not required for some RAM and I/O area.

Change and write data of EE-PROM

Removing PROTECT is required. The PROTECT is removed by setting as follows:

Page 1	Address 00	Data 01

(But CAMERA system don't need release, because don't set PROTECT.)

How to release each mode

Releasing from EE-PROM area	Be sure to return the data of PAGE 1 address 00 to 00 from 01, and then turn off the service mode of RM-95.
Releasing from RAM and I/O area	Turn off the service mode or turn off the power, because hoding of data is not required.

- In order to perform the pass track shift......Refer to page 13.
- In order to inhibit the emergency detection......Refer to the list in page 8.
- In order to check the emergency code......Refer to page 8.
- In order to operate the motor singly......Refer to page 11.
- In order to check the function switch......Refer to page 10.
- In order to check the mechanical switch......Refer to page 9.
- In order to read the A/D selecting value......Refer to page 11.
- In order to check the reception contents of the wireless remote control......Refer to page 11.

SECTION 2
MECHANICAL ADJUSTMENTS

For Mechanical Adjustments

Refer to mechanical adjustment (8 mm Video MECHANICAL ADJUSTMENT MANUAL III) manual for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-972-732-11)

For setting of the track shift mode, however, refer to the following.

2-1. SETTING THE TRACK SHIFT MODE

Note : Camera part and video part should have been installed.

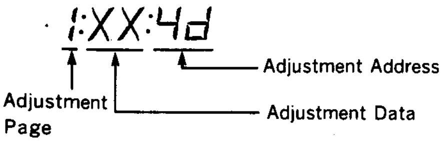
[Setting Method]

1) Set the adjustment commander to the HOLD ON side.
2) Press EDIT SEARCH + button once, and select page 1.
3) Select the adjustment address 4D with FF or REW button.
4) Set to 3X with PLAY and STOP button. (Setting of track shift mode)

Note : 3X should be the number from 31 to 3F. (To display "3X" with PLAY and STOP button is simple to shift.)

(When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).)

5) Set to the HOLD OFF side in order to set the normal mode.



(1X : TEST 1
2X : TEST 2 ('CH Playback)
3X : TEST 3 (Shift mode)
4X : Shift release)

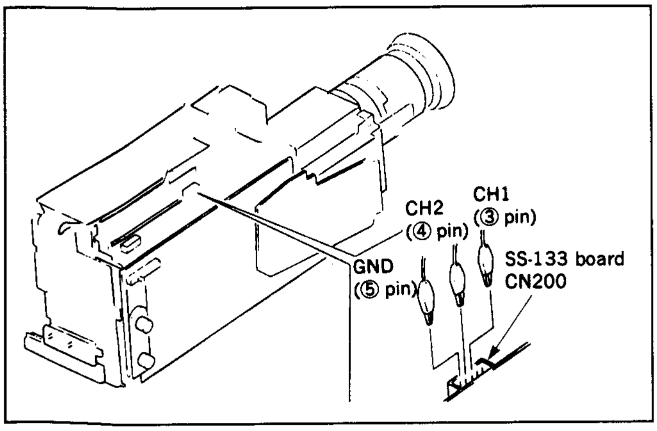


Fig. 2-1.

2-2. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guide, drum, capstan shaft, pinch roller.)
2) Connect to the oscilloscope.

(CH1 : SS-133 board CN200 pin ③ (RF OUT)
CH2 : SS-133 board CN200 pin ④ (RF SWP))

3) Play back the tracking alignment tape (WR5-1CP) (8-967-995-07).
4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. When not flat, make adjustment as follows. (Refer to mechanical adjustment manual.)

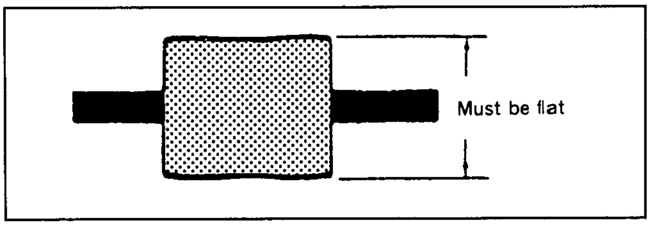


Fig. 2-2.

SECTION 3
CAMERA ADJUSTMENTS

PREPARATION FOR ADJUSTMENT (CAMERA BLOCK)
3-1. LIST OF SERVICING JIGS

- Oscilloscope
- Stabilized power supply (2 units)
- Adjusting screwdriver
- L lench
- Stop watch
- Color monitor TV
- Vectorscope
- Desk-top calculator

Ref. No.	Name	Part No.	Use
J-1	Filter (C14)	J-6080-054-A	Auto white balance adjustment
J-2	ND filter 0.1	J-6080-807-A	
	ND filter 0.3	J-6080-818-A	
	ND filter 0.4	J-6080-806-A	
	ND filter 0.9	J-6080-833-A	
	ND filter 1.0	J-6080-808-A	
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Color bar chart for pattern box	J-6020-250-A	
J-5	Extension cable (5P)	J-6082-043-A	To connect VC-67P board CN304 and DC-DC converter
	Extension cable (4P)	J-6082-042-A	To connect VC-67P board CN307 and VA-62 board CN650
J-6	Extension cable (12P)	J-6082-056-A	To connect VC-67P board CN305 and FD-15P board W201
J-7	Camera fixing jig	J-6080-894-A	
J-8	Siemens-star chart Transmission type simens-star chart	J-6080-875-A J-6080-923-A	Either of the siemens-star charts which appear during adjustment may be used.
J-9	Adjustment remote control * 1	J-6082-053-B	
J-10	AF microcomputer data reader jig * 2	J-6082-025-A	
J-11	CPA connector jig	J-6082-109-A	

* 1 Microcomputer IC in the adjustment Remote controller except for μPD7503G-C56-12 (8-759-148-35) does not allow the page selecting. Replace the microcomputer in such a case.

* 2 Change the fixed number of R1 from 10kΩ to 100kΩ in the AF microcomputer data reading jig. (If the number is kept to 10kΩ, the adjustment data can not change because of the difference of of the impedance.)
When adjustment the old-model Handy Cam, 100kΩ is allowed to perform the adustment.

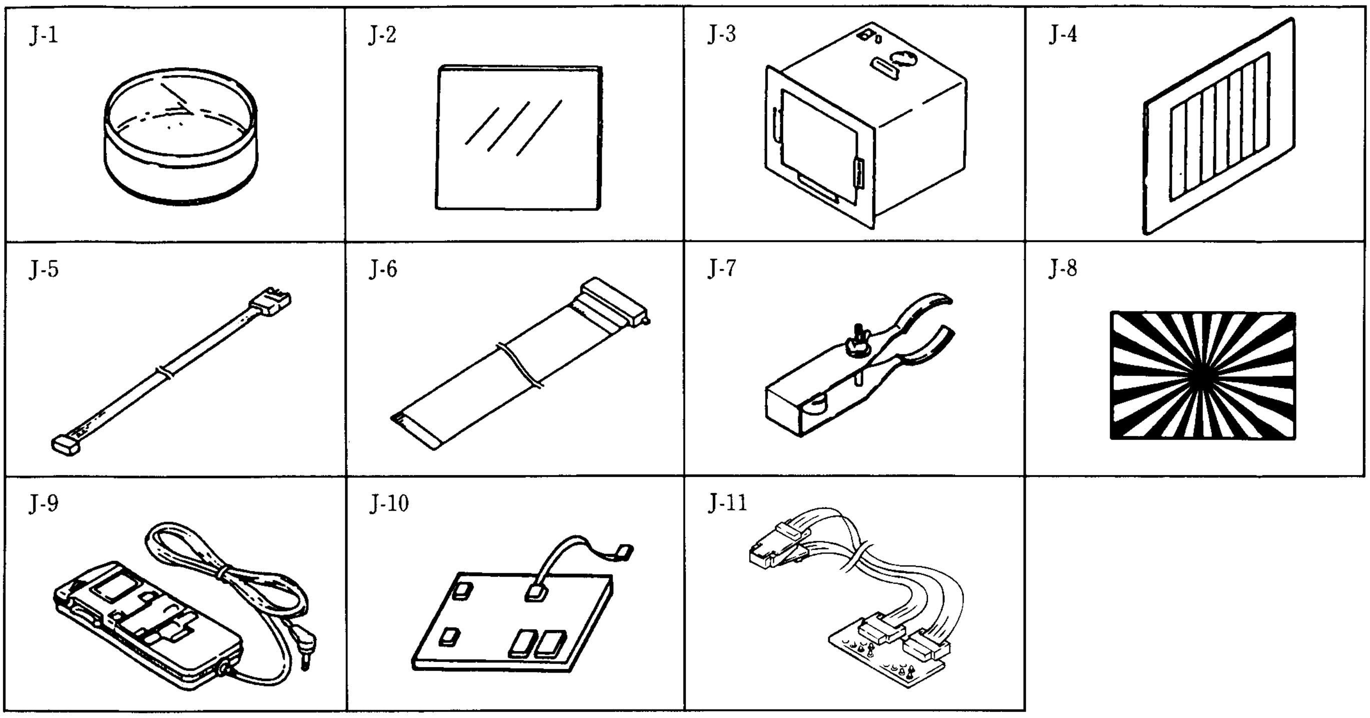

J-1
J-2
J-3
J-4
J-5
J-6
J-7
J-8
J-9
J-10
J-11

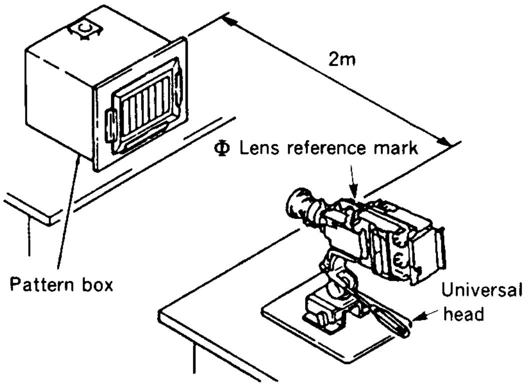
Fig. 3-1.

3-2. PREPARATION FOR ADJUSTMENT

3-2-1. Preparation

Note : Refer to the service manual, "SECTION 2. DISASSEMBLY" for details of the cabinet and individual boards removal procedure.

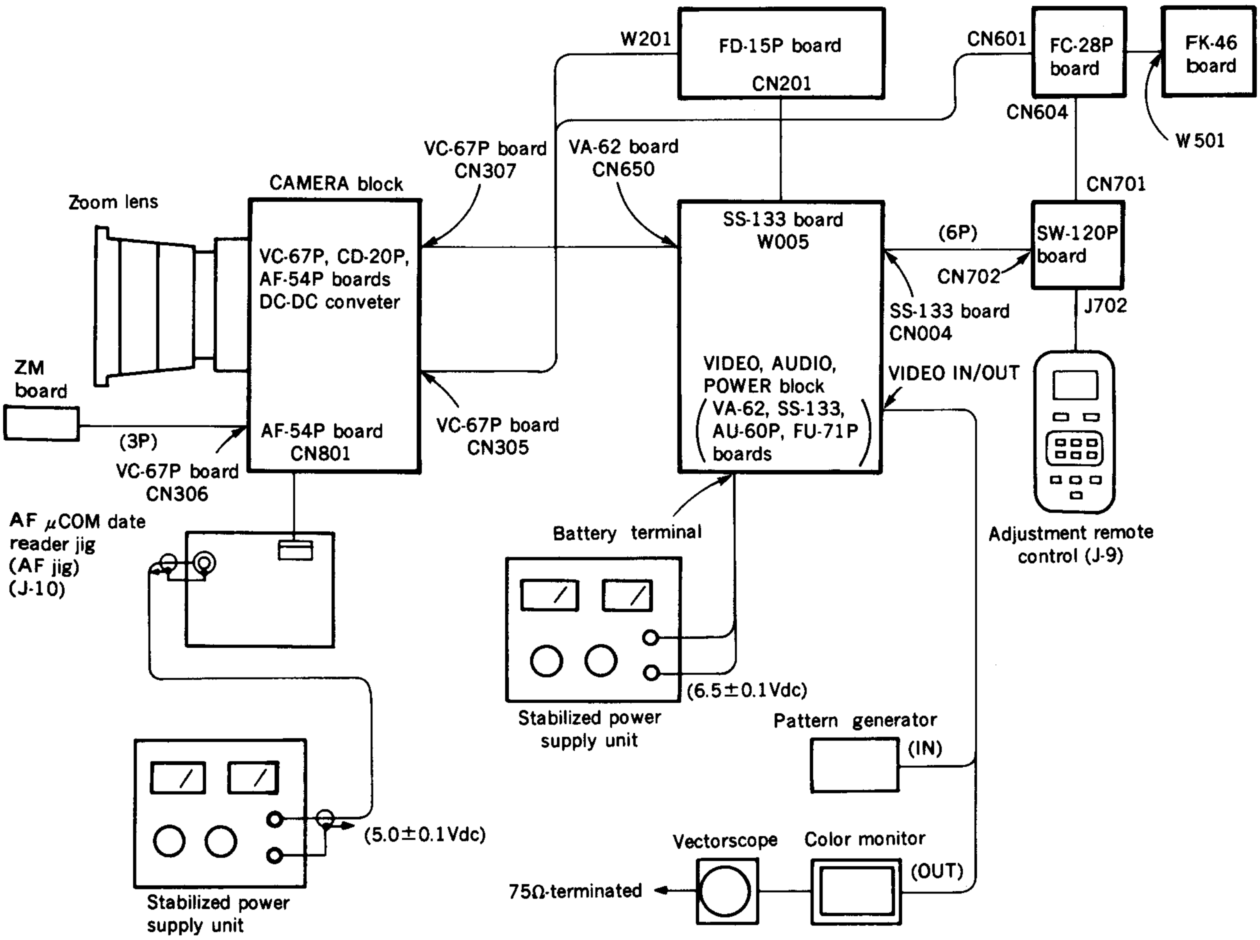
1) Connect the camera block and the video block by using the extension cable, and other equipment as shown in Fig. 3-3.
2) EVF (Electrical View Finder) section VF-26 or VF-27 boards is necessary for confirmation of shutter speed, white balance mode and etc.
   If not necessary, it can removed by taking out CN703 on the SW-120P board.
3) MIC board (MC-43P board) is not necessary. Remove it by taking out CN801 on the MC-43P board.



2m
Φ Lens reference mark
Pattern box
Universal head

When the camera block and the video block are separated with the cabinet removed, fix by using the camera fixing jig.

Fig. 3-2.



W201
FD-15P board
CN201
CN601
FC-28P board
FK-46 board
CN604
W501
VC-67P board CN307
VA-62 board CN650
CAMERA block
Zoom lens
VC-67P, CD-20P, AF-54P boards DC-DC conveter
SS-133 board W005
(6P)
SW-120P board
CN701
CN702
SS-133 board CN004
J702
ZM board
(3P)
VC-67P board CN306
AF-54P board CN801
VC-67P board CN305
VIDEO, AUDIO, POWER block (VA-62, SS-133, AU-60P, FU-71P boards)
VIDEO IN/OUT
AF μCOM date reader jig (AF jig) (J-10)
Battery terminal
Adjustment remote control (J-9)
(6.5±0.1Vdc)
Stabilized power supply unit
Pattern generator
(IN)
(5.0±0.1Vdc)
Stabilized power supply unit
Vectorscope
Color monitor
(OUT)
75Ω-terminated

Fig. 3-3.

3-2-2. Caution

1) Setting of switches
Unless otherwise specified, set the switches to the following position for making adjustments.
   1. CAMERA/VTR/POWER switch (S509 on FK-46 board)
   ......CAMERA
   2. STANDBY switch (S701 on SW-120P board)
   ......STANDBY
   3. AUTO LOCK switch (S217 on FD-15P board)
   ......OFF
   4. WHITE BALANCE button (S209 on FD-15P board)
   ......INDOOR mode ("-ꝺ-" indication appears on EVF.)
   5. FOCUS button (S212 on FD-15P board)
   ......MANUAL mode
   6. IRIS button (S201 on FD-15P board)
   ......CENTER
   7. SHUTTER SPEED button (S215 on FD-15P board)
   ......NORMAL mode (No indications of "100" "2000", etc. appear on EVF.)

2) Adjustment order
As a rule, adjust in described order.

3) Objects
   1. Color bar chart (standard picture frame)
   When making Adjustments by the use of a color bar chart, adjust the picture frame as shown in Fig. 3-4. (Standard picture frame)

Color Bar Chart Standard Picture Frame

☆ Basically, adjust the color bar chart standard picture frame with the under-scanning monitor as shown in Fig. a.

1) Place a black window with the horizontal width same as that of a color bar pattern, respectively on left and right sides of the screen. (A=B)
2) Put together lower ends of the color pattern and under-scanning monitor in the vertical direction.

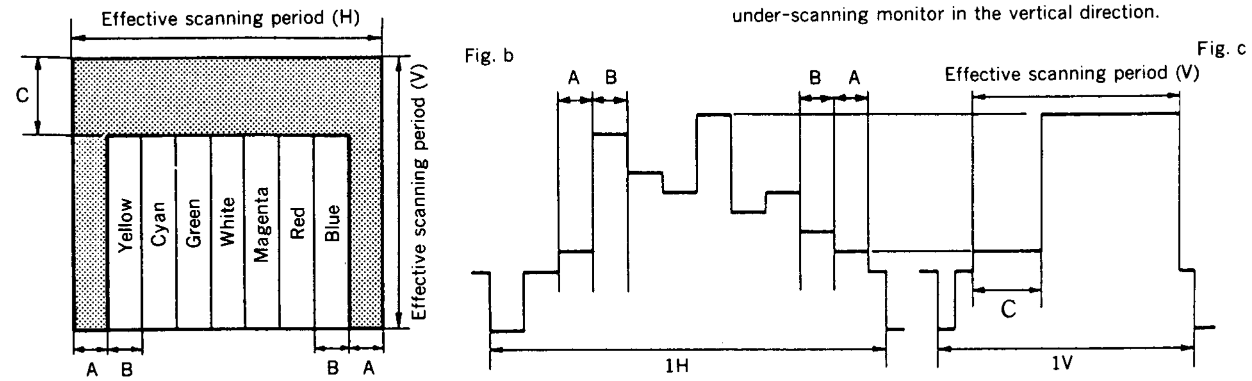


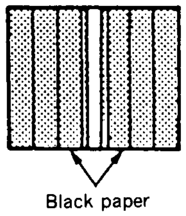
Fig. a
Effective scanning period (H)
C
Yellow
Cyan
Green
White
Magenta
Red
Blue
Effective scanning period (V)
A B
B A
Fig. b
A B
B A
1H
Fig. c
Effective scanning period (V)
C
1V

●To photograph the color bar chart standard picture frame shown in Fig. a. adjust Output Y(CN307 ① on VC-67Pboard)as shown in Fig. b and c.

Fig. 3-4.

   2. All white pattern
   Remove a color bar chart from the pattern box and set the zoom lever fully to the TELE side (80mm).
   3. High luminance pattern
   Prepare a high luminance pattern as shown in Fig. 3-5 and adjust the picture frame as shown in Fig. 3-6.
   4. Siements star (J-6080-875-A)
   orient a camera to have the siemens star center coincide with the monitor screen center on a monitor TV screen.

High luminance pattern


Black paper

Cover a color bar chart with black paper, except half the width of its white stripe. Then shoot the chart in this state.

Fig. 3-5.

High luminance pattern

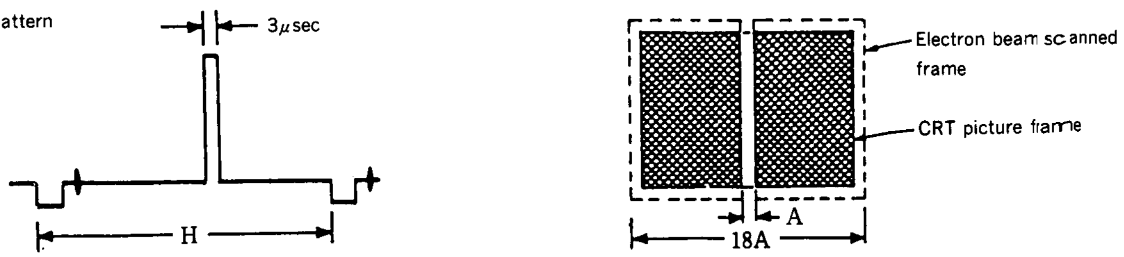

3μsec
H
Electron beam scanned frame
CRT picture frame
A
18A

Fig. a (camera output waveform of CPA pin Ⓐ8 on VC-67P board)

Fig. b (Picture of monitor TV screen)

By operating the camera zooming and orientation have the Fig. a output waveform output and the Fig. b monitor TV image displayed.

Fig. 3-6.

3-2-3. Adjustment Remote Control

In the camera block, the EVR (Electronic Variable Resistor) is used as an adjustment element in place of a conventional semi-fixed resistor. The EVR is controlled by the EVR/AWB microcomputer (VC-67P board IC501). This microcomputer reads the data written in the non-volatile memory inside the microcomputer and sends it to the EVR. The EVR generates an adjustment voltage by D-A conversion of this data (8 bits per one adjustment point).

To adjust, the camera block, therefore, it is necessary to rewrite the adjustment data written in the non-volatile memory. The adjustment remote control is used for this purpose. The adjustment remote control performs bidirectional communications with the microcomputer in the camera block through a remote control signal line (LANC). UP/DOWN commands for adjustment page, address and data are sent from the adjustment remote control to the microcomputer in the camera block. Sent from the microcomputer in the camera block to the adjustment remote control are the adjustment page, address and data.

Note : The microcomputer IC in the adjustment remote controller except for new microcomputer (UPD7503G-C56-12) dose not allow the page selecting. Replace with the new microcomputer (8-759-148-35) in such a case.

1. Using the Adjustment Remote Control

1) Connect the adjustment remote control to the REMOTE terminal (SW-120P board J701).
(Shift the HOLD switch of the adjustment remote control to the HOLD position (SERVICE position).)

2) Turn on the power for the main unit.

3) If the connection is correct, the following is displayed on the adjustment remote control LCD. (The adjustment data varies from one set to another.)

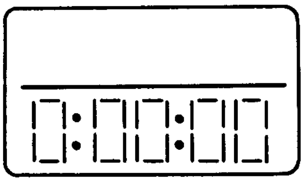


Fig. 3-7. (a)

4) Specify your desired adjustment page by the adjustment remote control.
Pressing the EDIT SEARCH (+) increments the adjustment page. Pressing the EDIT SEARCH (—) decrements it. The adjustment page is shown in the hexadecimal numbers and there are 16 of them from 1 to F. The CAMERA adjustment page is page F and Pressing the EDIT SEARCH (—) buttom one push.

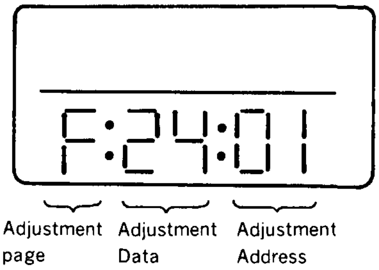


Fig. 3-7. (b)

5) Specify your desired adjustment address by the adjustment remote control. Pressing the FF (▶▶) button increments the adjustment address, and pressing the REW (◀◀) button decrements it.
(The adjustment address is shown in the decimal number and there are 256 of them from 00 to FF. The adjustment address corresponds to the output terminal of the EVR (IC301 on the VC-67P board, IC504 on the VC-67P board, and IC004 of the MX-10P board). Refer to Table 3-3 for adjustment of each address.)

6) Make adjustment by increasing/decreasing the adjustment data.
Pressing the PLAY (▶) button increases the adjustment data, and pressing the STOP (■) button decreases it.

- The adjustment data is shown in the hexadecimal number and assumes 256 kinds of values ranging from 00 to FF.

Hexadecimal No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Indication of LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal converted value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 4-1.

- The adjustment data corresponds to the output voltage of the EVR (IC301 on the VC-67P board, IC504 on the VC-67P board, and IC004 on the MX-10P board) as follows:
  - MX-10P board IC004 : 2.0 ⟷ 5.0 Vdc
  - VC-67P board IC301 : 0 ⟷ 5.0Vdc
  - VC-67P board IC504 : 1.0 ⟷ 3.5Vdc

7) Change the adjustment address with the FF (▶▶) or REW (◀◀) button in order to store the adjustment data into the non-volatile memory built in the EVR/AWB microcomputer (VC-67P board IC501).
(If this operation is omitted, new adjustment data will not be stored into the non-volatile memory.)

8) There is a function provided to make note of the last error cuased by the COUNTER RESET button during operation of the set even if the power is turned off. This LAST MEMO EMERGENCY (last error) can be cleared.

2. Cautions for Using the Adjustment Remote Control

Erroneous operation of the adjustment remote control may delete correct adjustment data. To avoid this, it is recommended to make note of all the adjustment data before adjustment and of new adjustment data every time adjustment of one item is completed.

3. List of Adjustment Addresses

Use the adjustment page F for the camera part adjustment of this unit.

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
01	MX-10P board IC004 pin ⑱	R CONT	Auto white balance adjustment	
02	MX-10P board IC004 pin ⑲	B CONT		
03	MX-10P board IC004 pin ②	C_1 GAIN	Matrix (3) C_1 gain adjustment	
04	MX-10P board IC004 pin ③	B GAIN	Pre-white balance adjustment	
05	MX-10P board IC004 pin ④	R GAIN		
06	MX-10P board IC004 pin ⑤	Y_2 GAIN	Matrix adjustment (2) Y_2 gain adjustment	
07	MX-10P board IC004 pin ⑥	Y_1 GAIN	Matrix adjustment (1) Y_1 gain adjustment	
08	MX-10P board IC004 pin ⑦	Y_H GAIN	Y_H level adjustment	
09	MX-10P board IC004 pin ⑧	R-Y GAIN	Color reproducibility adjustment	
0A	MX-10P board IC004 pin ⑨	B-Y GAIN		
0B	MX-10P board IC004 pin ⑫	R-Y HUE		
0C	MX-10P board IC004 pin ⑬	B-Y HUE		
0D	VC-67P board IC301 pin ⑱	SHP LEVEL	H aperture Adjustment	
0E	VC-67P board IC301 pin ⑲	Y LEVEL	White clip, Y level adjustments	
0F	VC-67P board IC301 pin ②	VAP GAIN		
10	VC-67P board IC301 pin ③	SET UP	Set up adjustment	
11	VC-67P board IC301 pin ④	C LEVEL	Chroma level adjustment	
12	VC-67P board IC301 pin ⑤	V SUB CONT	V sub adjustment	
13	VC-67P board IC301 pin ⑥	PG CONT	PG cont adjustment	
14	VC-67P board IC301 pin ⑦	Yr CONT		
15	VC-67P board IC301 pin ⑧	WHITE CLIP	White clip adjustment	
16	VC-67P board IC301 pin ⑨	SYNC LEVEL	Sync level adjustment	
17	VC-67P board IC301 pin ⑫	BURST LEVEL	Burst level adjustment	
18	VC-67P board IC301 pin ⑬	MAX GAIN	Set up, Max gain adjustments	
19	VC-67P board IC504 pin ⑱	IRIS REF	Iris adjustment	
1A	VC-67P board IC504 pin ⑲	AGC REF	AGC adjustment	
1B	VC-67P board IC504 pin ②	HALL GAIN	Hall adjustment	
1C	VC-67P board IC504 pin ③	HALL OFFSET		
1D	VC-67P board IC504 pin ④	FADER LEVEL	Fader level adjustment	
1E	VC-67P board IC504 pin ⑤	————		
1F	VC-67P board IC504 pin ⑥	FADER CONT	Fader level adjustment	
20	VC-67P board IC504 pin ⑦	FOCUS SPEED		
21	VC-67P board IC504 pin ⑧	ZOOM SPEED		
22	VC-67P board IC504 pin ⑨	M IRIS CONT	Not used	
23	VC-67P board IC504 pin ⑫	M AGC CONT		
24	VC-67P board IC504 pin ⑬	AGC IN PULSE		

Table 3-2 (1).

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
25		IN OUT		
26		M12-THR		
27		KATAMUKI		
28		FA-WM		
29		FA-BM	Auto Focus adjustment (1) AF Data Input Preparation	
2A		FH-WM		
2B		FH-BM		
2C		FA-SMH		
2D		FA-SML		
2E		FH-SMH		
2F		FH-SML		
30		LOW-F-SPEED	Focus Motor Speed adjustment	
31		MAN-F-SPEED		
32		STEP-A		
33		END-SENS-V		
34		ZOOM-POSI 1		
35		ZOOM-POSI 2		
36		ZOOM-POSI 3		
37		ZOOM-POSI 4	Macro Aria adjustment	
38		ZOOM-POSI 5		
39		FOCUS-POSI 1		
3A		SEARCH-V		
3B		BACK RUSH 2		
3C		BACK RUSH MODE 3		
3D		ZOOM-TAN-MASK		
3E		ZOOM-END-V		
3F		ZOOM-MODOSI		
40		BACK RUSH-ZOOM		
41		NOT WIDE STOP		
42		MODE 12 NG THR		
43		FA-BASE-IN		
44		FA-BASE-OUT		
45		AGC-W	Auto Focus adjustment (1) AF Data Input Preparation	
46		AGC-B		

Table 3-2 (2).

Adjust-ment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
47		MODE 12 NG LIMIT H		
48		MODE 12 NG LIMIT L		
49		M2 HANTEN		
4A		MODE 5 THR 1		
4B		YOGIRI-IN		
4C		MODE 5 FH FILT		
4D		MODE 5 THR 2 IN		
4E		MODE 5 THR 3		
4F		FH-NG-COUNT		
50		TYUU WAKU		
51		YOGIRI-OUT		
52		MODE 5 THR 20 OUT		
53		AF IRIS IN OUT		
54		MACRO TIME OUT H		
55		MACRO TIME OUT L		
56		MACRO SEARCH		
57		SEISHI		
58		ZOOM-SPEED 1		
59		ZOOM-SPEED 2		
5A		ZOOM-SPEED 3		
5B		ZOOM-SPEED 4		
5C		TANTEN MODE		
5D		BACK RUSH M5		
5E		————		
5F		————		
60		IRIS REF-NOR	Standard AE level adjustment	
61		IRIS REF-PO		
62		IRIS REF-SP		
63		IRIS DATA 1	IRIS manual data adjustment	
64		GAIN-REF	Manual gain data adjustment	
65		GAIN-MAX		
66		EMG-AGC	Warning display level adjustment	
67		EMG-AGC-HYS		
68		EMG-AE (H)		
69		EMG-AE (L)		

Table 3-2 (3).

Adjust-ment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
6A		EMG-AE-HYS (H)		
6B		MAXSHUT-PO (H)		
6C		MAXSHUT-PO (L)		
6D		MAXSHUT-SP (H)		
6E		MAXSHUT-SP (L)		
6F		REF-WIDTH (H)		
70		REF-WIDTH (L)		
71		SHUT-MULTI (H)		
72		SHUT-MULTI (L)		
73		SHUT-COUNT 1		
74		SHUT STEP-MULTI		
75		IRIS OPEN		
76		REF-TURBO (H)		
77		REF-TURBO (L)		
78		TURBO-WIDTH (H)		
79		TURBO-WIDTH (L)		
7A		TURBO-TR (H)		
7B		TURBO-TR (L)		
7C		SHUT-COUNT 2		
7D		SHUT-COUNT 3		
7E		IRIS CLOSE DATA		
7F		————		
80		USER R-Y GAIN		
81		USER B-Y GAIN		
82		USER B-Y HUE		
83		USER R-Y HUE		
84		USER SHP LEVEL		
85		USER Y LEVEL		
86		————		
87		————		
88		————		
89		————		
8A		————		
8B		————		
8C		————		

Table 3-2 (4).

Adjust-ment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
8D		————	AE Check 1. Portrait mode check	
8E		————	AE Check 2. Sports mode check	
8F		————	AE Check 3. Iris Preceding mode check	
90		R3200 MSB		
91		R3200 LSB		
92		R3200 MSB		
93		R3200 LSB		
94		G3200 MSB		
95		G3200 LSB		
96		SHUTTER IN	Shutter IN/OUT adjustment	
97		SHUTTER OUT		
98		START R	Auto white balance adjustment	
99		START B		
9A		R OUT DOOR		
9B		B OUT DOOR		
9C		————		
9D		————		
9E		————		
9F		————		
A0		Ra	Auto white balance adjustment	
A1		Rb		
A2		Rc		
A3		Ba		
A4		Bb		
A5		Bc		
A6		R/B TOP		
A7		R/B MDL		
A8		R/B BTM		
A9		B/R TOP		
AA		B/R MDL		
AB		B/R BTM		
AC		BTM SLP R		
AD		BTM SLP B		
AE		MDL SLP R		
AF		MDL SLP B		

Table 3-2 (5).

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
B0		TOP SLP R	Auto white balance adjustment	
B1		TOP SLP B		
B2		KEIKO R		
B3		KEIKO B		
B4		BTM UP		
B5		BTM DWN		
B6		MDL UP		
B7		MDL DWN		
B8		TOP UP	Auto white balance adjustment	
B9		TOP DWN		
BA		KEIKO		
BB		KEIKO DWN		
BC		R TOP LMT		
BD		R DWN LMT	Auto white balance adjustment	
BE		B TOP LMT		
BF		B IN TOP		
C0		B IN MAX		
C1		B OUT MIN		
C2		B OUT DWN		
C3		B DWN LMT		
C4		LL LMT		
C5		TM DIVID		
C6		BM DIVID		
C7		DELAY TM		
C8		FAST TM		
C9		OUT HYS OFF		
CA		OUT B HYS		
CB		————		
CC		————		
CD		————		
CE		————		
CF		————		
D0		SYSTEM	NTSC/PAL select, MODEL SELECT	
D1		————		
D2		————		

Table 3-2 (6).

<table>
<tr><th>Adjustment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Memo Column</th></tr>
<tr><td>D3</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D4</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D5</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D6</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D7</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D8</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D9</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DA</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DB</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DC</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DD</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DE</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DF</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E0</td><td></td><td>DISPLAY MODE</td><td>The following adjustment mode is selected by changing the adjustment data.
<table>
<tr><th>Adjustment data.</th><th>Adjustment Mode</th></tr>
<tr><td>00</td><td>DISPLAY MODE, R, B, CONT</td></tr>
<tr><td>01</td><td>NEW R, B</td></tr>
<tr><td>02</td><td>R RATIO</td></tr>
<tr><td>03</td><td>B RATIO</td></tr>
<tr><td>04</td><td>R GAIN</td></tr>
<tr><td>05</td><td>B GAIN</td></tr>
<tr><td>06</td><td>RM DATA</td></tr>
<tr><td>07</td><td>GM DATA</td></tr>
<tr><td>08</td><td>BM DATA</td></tr>
<tr><td>09</td><td>NORM R</td></tr>
<tr><td>0A</td><td>NORM B</td></tr>
<tr><td>0B</td><td>R DATA</td></tr>
<tr><td>0C</td><td>G DATA</td></tr>
<tr><td>0D</td><td>B DATA</td></tr>
<tr><td>0E</td><td>R, B AIM</td></tr>
<tr><td>0F</td><td>ERROR</td></tr>
</table></td><td>00</td></tr>
<tr><td>E1</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E2</td><td></td><td>—</td><td></td><td></td></tr>
</table>

Table 3-2 (7).

<table>
<tr><th>Adjust-ment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Memo Column</th></tr>
<tr><td>E3</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E4</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E5</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E6</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E7</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E8</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E9</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>EA</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>EB</td><td></td><td>MODE</td><td>The following adjustment mode is selected by changing the adjustment data.
<table>
<tr><th>Adjustment Data</th><th>Adjustment Mode</th></tr>
<tr><td>00</td><td>NORMAL</td></tr>
<tr><td>01</td><td>F-HANTING</td></tr>
<tr><td>03</td><td>ZOOM-POSI</td></tr>
<tr><td>05</td><td>IRIS-POSI</td></tr>
<tr><td>0B</td><td>AGC-CONT</td></tr>
<tr><td>0D</td><td>FOCUS-POSI</td></tr>
<tr><td>11</td><td>SHUTTER IN/OUT</td></tr>
<tr><td>13</td><td>AE LEVEL</td></tr>
<tr><td>ED</td><td>FILTER-FHM</td></tr>
<tr><td>EF</td><td>FILTER-FAM</td></tr>
<tr><td>F1</td><td>FILTER-SFH L</td></tr>
<tr><td>F3</td><td>FILTER-SFH H</td></tr>
<tr><td>F5</td><td>FILTER-SFA L</td></tr>
<tr><td>F7</td><td>FILTER-SFA H</td></tr>
<tr><td>F9</td><td>FILTER-FA L</td></tr>
<tr><td>FB</td><td>FILTER-FH L</td></tr>
<tr><td>FD</td><td>FILTER-FA H</td></tr>
<tr><td>FF</td><td>FILTER-FH H</td></tr>
</table></td><td></td></tr>
<tr><td>EC</td><td></td><td>AWB MODE 3</td><td></td><td></td></tr>
<tr><td>ED</td><td></td><td>AWB MODE 2</td><td></td><td></td></tr>
<tr><td>EE</td><td></td><td>AWB MODE 1</td><td>The following auto white balance adjustment mode is selected by changing the adjustment data.
<table>
<tr><th>Adjustment Data</th><th>Adjustment Mode</th></tr>
<tr><td>00</td><td>AWB MODE 1</td></tr>
<tr><td>10</td><td>WB DIRECT</td></tr>
<tr><td>F0</td><td>WB FREE</td></tr>
<tr><td>01</td><td>3200k Data fetch 1</td></tr>
<tr><td>23</td><td>3200k Data fetch 2</td></tr>
</table></td><td></td></tr>
</table>

Table 3-2 (8).

Adjust-ment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
EF		————		
F0		————		
F1		————		
F2		————		
F3		————		
F4		————		
F5		————		
F6		————		
F7		————		
F8		————		
F9		————		
FA		————		
FB		————		
FC		————		
FD		————		
FE		————		
FF		————		

Table 3-2 (9).

3-2-4. Checkpoint Array

Most measurement points for adjustment of the camera block are concentrated on the checkpoint array of the VC-67P board.

Solder a short lead wire, etc. to the terminal required for adjustment and connect an oscilloscope. Table 3-3 shows the terminal numbers and signal names of the checkpoint array.

Terminal No.	Signal Name	Terminal No.	Signal Name
A1	N.C	B1	N.C
A2	PG CONT	B2	N.C
A3	N.C	B3	Y (LPF) OUT
A4	N.C	B4	V SUB
A5	VAP OUT	B5	VAP SLICE
A6	TP	B6	N.C
A7	WB-G	B7	Y_H GAIN
A8	CAM Y	B8	Y_2 GAIN
A9	YH	B9	N.C
A10	CAM C	B10	GND
A11	YH OUT 1	B11	IRIS OUT

Table 3-3.

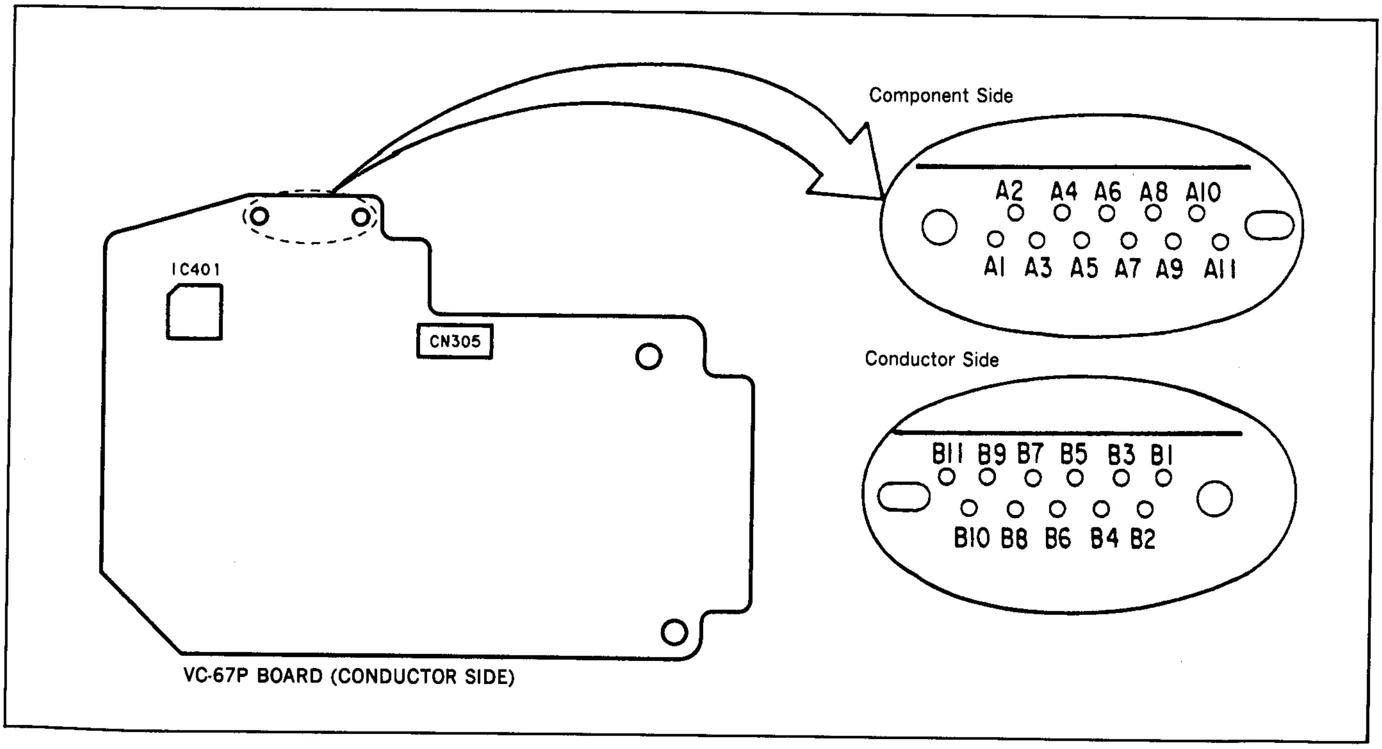

Component Side
A2 A4 A6 A8 A10
A1 A3 A5 A7 A9 A11
Conductor Side
B11 B9 B7 B5 B3 B1
B10 B8 B6 B4 B2
IC401
CN305
VC-67P BOARD (CONDUCTOR SIDE)

Fig. 3-8.

3-2-5. AF Microcomputer Data Reader Jig

The AF microcomputer data reader jig converts adjustment serial data outputted from the AF microcomputer (AF-54P board CN801) (different data are outputted depending on the adjustment mode, such as HALL (iris) state, focus state, focus motor speed, zoom ring position, etc.) into 2-digit hexadecimal numbers and indicates on the LED.

〔Connection〕

Connect as shown in the figure below :

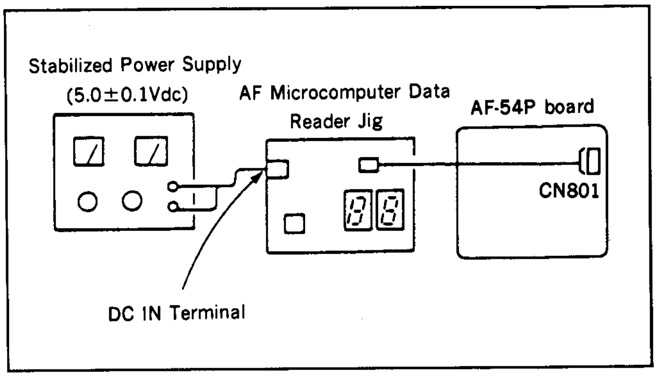


Fig. 3-9.

3-2-6. Data Processing

In order to obtain adjustment data in some adjustment items, it is necessary to compute the display data (hexadecimal number) of the AF microcomputer data reader jig and adjustment remote control. In this case, convert the hexadecimal number into the decimal number before computation, convert its computed result back into the decimal number to assume it as the adjustment data. Table 3-4 shows a hexadecimal-decimal conversion table.

Hexadecimal — Decimal Conversion Table

Higher Digit of Hex. No. Lower Digit of Hex. No.	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	②↓ D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A(A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
①→ B(b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C(c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D(d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E(E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F(F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note : Values in parentheses are those displayed on the AF microcomputer reader jig or adjustment remote control.

(Example) When the AF microcomputer reader jig or adjustment remote control displays "BD (bd) ;
Since the higher digit of the hexadecimal number is B (b) and its lower digit is D (d), the decimal number to be obtained is "189" at an intersecting point of ① and ② in the table above.

Table. 3-4.

3-3. ADJUSTMENT OF CAMERA SYSTEM

- In principle, all adjustments must be made in accordance with Adjustment procedure.
- When replacing CCD imager, do not forget to adjust the camera system property.

3-3-1. Prime Oscillation Adjustment (CD-20P Board)

Object	Color bar chart standard picture frame
Measurement point	DT-77 board pin ② (CL143)
Measuring instrument	Frequency counter
Adjustment element	CT122
Specified value	14187500±71Hz

Note : Connect the frequency counter through a buffer amplifier (Oscilloscope, etc.) having high impedance and low capacitance.

[Adjustment Method]

1) Adjust to 14187500±71Hz with CT122.

3-3-2. PLL Adjustment (CD-20P Board)

Object	Optional
Measurement point	See Fig. 4-10.
Measuring instrument	Digital voltmeter
Adjustment element	CT121
Specified value	2.5±0.2Vdc

[Adjustment Method]

1) Adjust to 2.5±0.2Vdc with CT121.

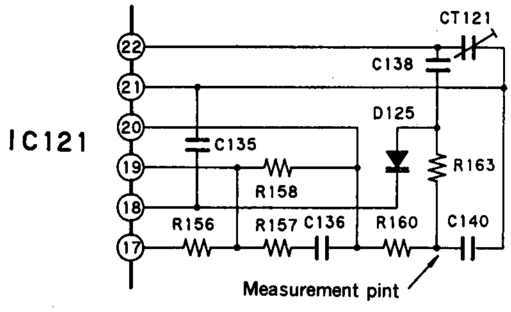


Fig. 3-10.

3-3-3. Flange Back Adjustment

Object	Siemens star (at 2 m in front of the lens datum level ϕ mark)
Measurement point	Check with the monitor TV.
Measuring instrument	
Adjustment element	Flange back adjusting pin
Tools	Phillips screwdriver

[Adjustment Method]

1) Press the FOCUS button (FD-15P board S212) to select the MANUAL mode.
2) Place the Siemens star at a distance of 2 m in front of the lens datum level (refer to Fig. 3-2).
3) Adjust a camera block position to center the Siemens star on the monitor screen with the monitor screen.
4) Check that the lens zoom lever can be moved fully to the WIDE end (8.0 mm) and TELE end (80 mm), respectively, and fix it at the WIDE end. (When this is done, check also zooming operation on the monitor screen.)
5) Set the lens focusing mark at the center of "2".

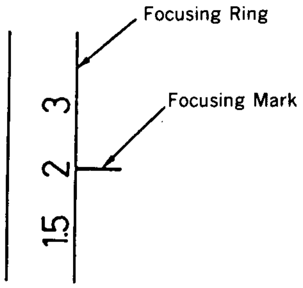


Fig. 3-11.

6) Loosen the flange back setscrew ❶ with the Phillips screwdriver. (Refer to Fig. 3-13)
7) Viewing the monitor screen, turn the glange back adjusting pin ❷ to make clearest the wedge located at the center of the Siemens star on the screen. (Turn it 2 to 3 times to the right and left to check the wedge to be clearest.)

   Note : Do not turn the adjusting pin excessively in one direction at a time.
8) Holding the flange back adjusting pin ❷ not to turn it further, tighten the flange back setscrew ❶.
9) With the zoom lever fixed at the WIDE end, turn the focusing ring and stop it at a position which provides the clearest image of the wedge. Check that the focusing ring is within the range shown in Fig. 3-12 at this time.

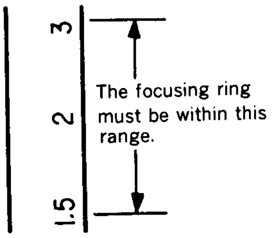


Fig. 3-12.

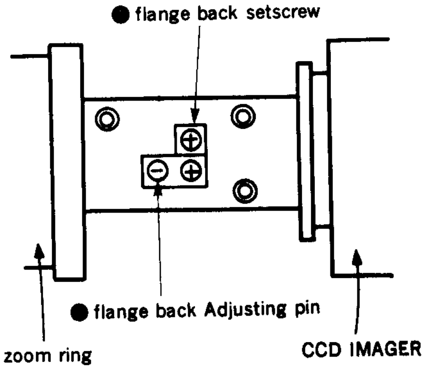


Fig. 3-13.

10) Fix the zoom lever at the TELE end.
11) Turn the focusing ring and stop it at a position which provides the clearest wedge image. When this is done, check that the focusing ring is within a range of ±1.5mm from the center of "2".

3-3-4. Camera DC-DC Converter Voltage Check (VC-67P Board/CD-20P Board)

Measuring isntrument	Digital voltmeter
15V check	
Measurement point	CN101 pin ① (CD-20P Board)
Specified value	15.0±0.2V_{DC}
−9V check	
Measurement point	CN101 pin ② (CD-20P Board)
Specified value	−9.00±0.15V_{DC}
4.9V check	
Measurement point	CN101 pin ③ (CD-20P Board)
Specified value	4.9±0.1V_{DC}
CAM 4.9V check	
Measurement point	CN304 pin ④ (VC-67P Board)
Specified value	4.9±0.1V_{DC}

[Checking Method]

1) Each supply voltage must meet the specified value.

3-3-5. EVR Initial Setting of Adjustment Page F.

Set to the following initial settings of the adjustment data only when the CCD IMAGER was replaced.
Make initial setting of adjustment data when the EVR/AWB microcomputer is replaced.
(Pre-replacement microcomputer data will do.)

Adjustment Address	Adjustment Data Initial Value
0E (Y LEVEL)	9C
0F (VAP GAIN)	90
10 (SET UP)	70
12 (VSUB CONT)	3A
13 (PG CONT)	5A
14 (Yr CONT)	93
15 (WHITE CLIP)	FF
18 (MAX GAIN)	E0
19 (IRIS REF)	4C
1F (FADER CONT)	00
25 (IN OUT)	00
26 (M12-THR)	30
27 (KATAMUKI)	04
28 (FA-WM)	03
2C (FA-SMH)	00
2D (FA-SML)	00
2E (FH-SMH)	00
2F (FH-SML)	00
30 (LOW-F-SPEED)	34
31 (MAN-F-SPEED)	22

Adjustment Address	Adjustment Data Initial Value
32 (STEP-A)	02
33 (END-SENS-V)	20
34 (ZOOM-POSI 1)	38
35 (ZOOM-POSI 2)	6D
36 (ZOOM-POSI 3)	A2
37 (ZOOM-POSI 4)	DA
38 (ZOOM-POSI 5)	F3
39 (FOCUS-POSI 1)	48
3A (SEARCH-V)	00
3B (BACK RUSH 2)	02
3C (BACK RUSH-MODE 3)	05
3D (ZOOM-TAN-MASK)	20
3E (ZOOM-END-V)	20
3F (ZOOM-MODOSI)	0C
40 (BACK RUSH-ZOOM)	0F
41 (NOT WIDE STOP)	00
42 (MODE 12 NG THR)	02
43 (FA-BASE H-IN)	0C
44 (FA-BASE-OUT)	0C
47 (MODE 12 NG LIMIT H)	02
48 (MODE 12 NG LIMIT L)	00
49 (M2 HANTEN)	04
4A (MODE 5 THR 1)	06
4B (YOGIRI-IN)	1E
4C (MODE 5 FH FLT)	01
4D (MODE 5 THR 2 IN)	05
4E (MODE 5 THR 3)	05
4F (FH-NG-COUNT)	1E
50 (TYUU WAKU)	00
51 (YOGIRI-OUT)	1E
52 (MODE 5 THR 20 OUT)	05
53 (AF IRIS IN OUT)	B9
54 (MACRO TIME OUT H)	00
55 (MACRO TIME OUT L)	00
56 (MACRO SEARCH)	00
57 (SEISHI)	02
58 (ZOOM-SPEED 1)	40
59 (ZOOM-SPEED 2)	20
5A (ZOOM-SPEED 3)	00
5B (ZOOM-SPEED 4)	53
5C (TANTEN MODE)	00
5D (BACK RUSH M5)	02

Adjustment Address	Adjustment Data Initial Value
60 (IRIS REF NOR)	60
61 (IRIS REF PO)	60
62 (IRIS REF SP)	60
63 (IRIS DATA 1)	BE
64 (GAIN-REF)	30
65 (GAIN-MAX)	D0
66 (EMG AGC)	A0
67 (EMG-AGC-HYS)	05
68 (EMG-AE (H))	06
69 (EMG-AE (L))	00
6A (EMG-AE-HYS (H))	01
6B (MAX SHUT-PO (H))	00
6C (MAX SHUT-PO (L))	CE
6D (MAX SHUT-SP (H))	00
6E (MAX SHUT-SP (L))	E6
6F (REF-WIDTH (H))	01
70 (REF-WIDTH (L))	00
71 (SHUT-MULTI (H))	06
72 (SHUT-MULTI (L))	00
73 (SHUT-COUNT 1)	06
74 (SHUT STEP-MULTI)	02
75 (IRIS-OPEN)	60
76 (REF-TURBO (H))	06
77 (REF-TURBO (L))	00
78 (TURBO-WIDTH (H))	01
79 (TURBO-WIDTH (L))	00
7A (TURBO-TR (H))	01
7B (TURBO-TR (L))	00
7C (SHUT-COUNT 2)	01
7D (SHUT-COUNT 3)	01
7E (IRIS CLOSE DATA)	FF
80 (USER R-Y GAIN)	10
81 (USER B-Y GAIN)	0D
82 (USER B-Y HUE)	0D
83 (USER R-Y HUE)	0C
84 (USER SHP LEVEL)	0A
85 (USER Y LEVEL)	0C
96 (SHUTTER IN)	B1
97 (SHUTTER OUT)	8B
AC (BTM SLP R)	30
AD (BTM SLP B)	70
AE (MDL SLP R)	40

Adjustment Address	Adjustment Data Initial Value
AF (MDL SLP B)	40
B1 (TOP SLP B)	10
B2 (KEIKO R)	80
B3 (KEIKO B)	30
B4 (BTM UP)	CF
B5 (BTM DWN)	98
B6 (MDL UP)	BE
B7 (MDL DWN)	9B
BA (KEIKO)	C4
BB (KEIKO DWN)	AC
BC (R TOP LMT)	A0
C3 (B DOWN LMT)	26
C4 (LL LMT)	06
C5 (TM DIVID)	6E
C6 (BM DIVID)	41
C7 (DELAY TM)	0A
C8 (FAST TM)	30
C9 (OUT HYS OFF)	15
CA (OUT B HYS)	0D
D0 (SYSTEM)	02
EC (AWB MODE 3)	01
ED (AWB MODE 2)	00
EE (AWB MODE 1)	00

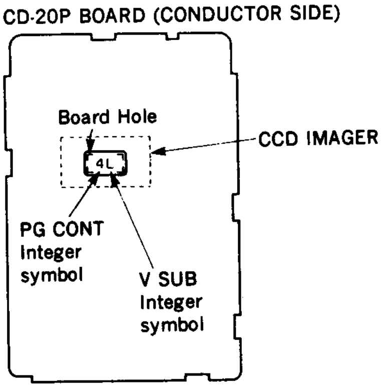
Table. 3-5.

[Adjustment Method]

1) Set the adjustment page F with the adjustment remote control.
2) Set the adjustment data for each adjustment address to the initial value with the adjustment remote control.
3) Change the adjustment address in order to memorize the last adjustment data.

3-3-6.PG CONT/V SUB Adjustment (VC-67P/CD-20P Boards)

Note : PG CONT specified voltage and V SUB specified volatage are indicated by the two digits on CCD imager.



● PG CONT

Integer symbol	Voltage (V)
0	0.5
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

● V SUB

Integer symbol	Voltage (V)	Integer symbol	Voltage (V)	Integer symbol	Voltage (V)
A	7.0	J	11.0	S	15.0
B	7.5	K	11.5	T	15.5
C	8.0	L	12.0	U	16.0
D	8.5	M	12.5	V	16.5
E	9.0	N	13.0	W	17.0
F	9.5	P	13.5	X	17.5
G	10.0	Q	14.0	Y	18.0
H	10.5	R	14.5	Z	18.5

Example : For「4L」display,
•PG CONT=2.5V
•V SUB=12.0V

Fig. 3-14.

A. PG CONT Adjustment

Object	Not used
Measurement point	Checkpoint array pin (A2) (PG CONT)
Measuring instrument	Digital voltmeter
Adjustment page	F
Adjustment address	13 (PG CONT)
Specified value	(CCD imager specified voltage) $\pm 0.1V_{dc}$

[Adjustment Method]

1) Set the adjustment page F and the adjustment address 13 with the adjustment remote control.
2) Change the adjustment data to be (CCD imager specified voltage) ± 0.1Vdc with the adjustment remote control.
3) Change the adjustment address to store the adjustment data.

B. V SUB Adjustment

Object	Not used
Measurement point	Checkpoint array pin(B4)(V SUB)
Measuring equipment	Digital voltmeter
Adjustment page	F
Adjustment address	12 (V SUB)
Specified value	(CCD imager specified voltage) ±3%

[Adjustment Method]

1) Set the adjustment page F and the adjustment address 12 with the adjustment remote control.
2) Change the adjustment data to be (CCD imager specified voltage) ±3% with the adjustment remote control.
3) Change the adjustment address to store the adjustment data.

3-3-7. HALL Adjustment (AF-54P Board)

Object	White pattern standard frame All black (Put the black cap on the lens.)
Measurement point	CN801
Measuring instrument	AF microcomputer data reading jig
Adjustment page	F
Adjustment address	1B (HALL GAIN) 1C (HALL OFFSET)
Specified value	White pattern imaging: C0±01 ALL black imaging: 03±02

[Adjustment Method]

1) Set the adjustment page F with the adjustment remote control.
2) Set the adjustment address EB and the adjustment data 05 with the adjustment remote control.
3) Set the adjustment page 1B with the adjustment remote control.
   Pick up the image of the all white pattern in the zoom position of the color bar standard frame, set the adjustment data C0±01.
   Put the black cap on the lens, select all black imaging, and set the adjustment data 03±02.
4) Set the adjustment page 1C with the adjustment remote control.
   Pick up the image of the all white pattern in the zoom position of the color bar standard frame, set the adjustment data C0±01.
   Put the black cap on the lens, select all black imaging, and set the adjustment data 03±02.
5) Repeat steps 2) and 3) until the specifications are satisfied.
6) Set the adjustment address EB and the adjustment data 00 with the adjustment remote control.
7) Change the adjustment address in order to store the adjustment data.

3-3-8. IRIS Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Filter	ND filter 0.4 and 0.1
Measurement point	Checkpoint array pin (B11) (IRIS OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	19 (IRIS)
Specified value	150±10 mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 19 with the adjustment remote control.
2) With no ND filter attached, change the adjustment data with the adjustment control to adjust the IRIS OUT signal level to 150±10 mV.
3) Attach the ND filter 0.5 (0.4+0.1) in front of the lens and check that the signal level changes smoothly.
4) Remove the ND filter and check that the signal level is 150±20 mV.
5) When the specified value is not met, repeat the steps 2) through 4).
6) Change the adjustment address in order to store the adjustment data.

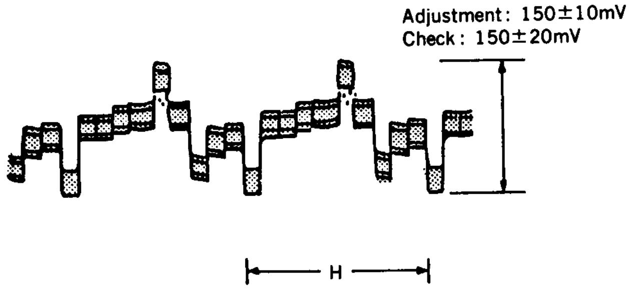


Fig. 3-15.

3-3-9. Shutter IN/OUT Adjustment (AF-54P Board)

Object	White pattern standard picture frame All black
Filter	ND filter: 0.4×1pcs., 0.1×1pc.
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F
Adjustment address	96 (SHUTTER IN) 97 (SHUTTER OUT)
Specified value	Data A≧84 Data B=FF

[Adjustment Method]

1) Select the adjustment page F and the adjustment address EB with the adjustment remote control.
2) Attach the ND filter 0.5 (0.4+0.1) to the front of the lens, and read the AF jig data (This data is assumed as data A.)
3) Set the adjustment address 97 by adjustment remote control and enter to the adjustment data A.
4) Set the adjustment address 96 by adjustment remote control and enter to the adjustment data A+0A.
5) Attach the ND filter 0.5 (0.4+0.1) to the front of the lens, and attach the lens cap, after two second, read the AF microcomputer data reader jig. (This data is assumed as data B.)
6) Check that the specified value of data B is satisfied.
7) Change the adjustment address to EB to set the adjustment data to 00.
8) Change the adjustment address in order to store the adjustment data.

3-3-10. AGC Adjustment (VC-67P Board)

Note : When there is much noise, measure by inserting 5.6kΩ resistance.

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin(B3) (Y (LPF) OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	1A (AGC)
Specified value	180±5 mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 1A with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to set the Y (LPF) signal level to 180±5 mV.
3) Change the adjustment address in order to store the adjustment data.

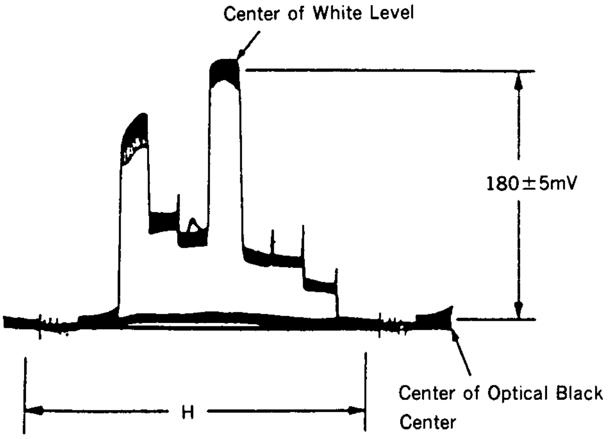


Fig. 3-16.

3-3-11. Matrix Adjustment

(1) Y1 Gain Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin(A5)(VAP OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	07 (Y_1 Gain)
Specified value	$Y_0-Y_1=0\pm5$mV

[Preparation]

1) Short the checkpoint array pin(B8)(Y_2 Gain) and pin(B5) (VAP SLICE) with GND.

[Adjustment Method]

1) Select the adjustment page F by the adjustment remote control.
2) Select the adjustment address 0F by the adjustment remote control and preset the adjustment data to be 00. (VAP GAIN : MAX)
3) Select the adjustment address 07 by the adjustment remote control.
4) Change the adjustment data and set the Y_0-Y_1 waveform to be a straight line. (There should not be difference.)
5) Change the adjustment address in order to store the adjustment data.
6) Open the checkpoint array pin(B8) and pin(B5)

Note : After the adjustment, be sure to adjust the matrix (2) Y_2 Gain Adjustment.

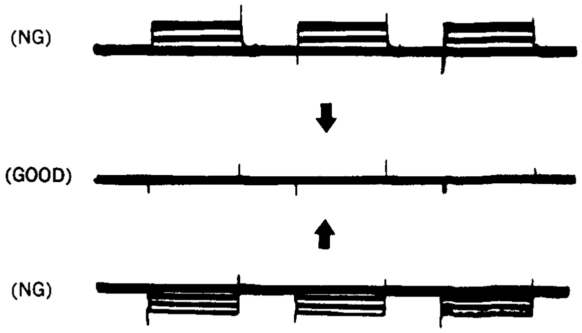


Fig. 3-17.

(2) Y_2 Gain Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin(A5)(VAP OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	06 (Y_2 GAIN)
Specified value	0±5mV

[Preparation]

1) Short the chickpoint array pin(B5)(VAP SLICE) with GND.

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address 0F by the adjustment remote control and preset the adjustment data to be 00. (VAP GAIN : MAX)
3) Select the adjustment address 06 by the adjustment remote control.
4) Change the adjustment data and set the $(Y_1-\frac{Y_0+Y_2}{2})$ waveform to be a straight line. (There should not be difference.)
5) Select the adjustment address 0F by the adjustment remote control and set the adjustment data to be 90.
6) Change the adjustment address in order to store the adjustment data.
7) Open the checkpoint array pin(B5)

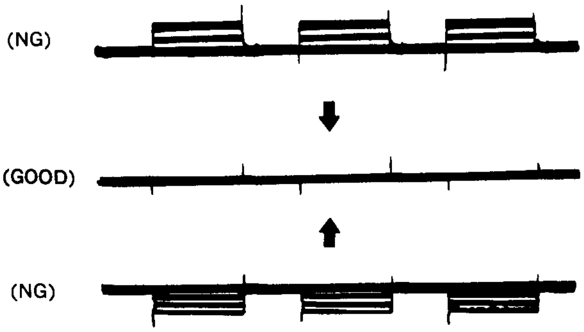


Fig. 3-18.

(3) C_1 Gain Adjustment

Object	Color bar chart standard picture frame
Measurement point	VIDEO OUT terminal
Measuring instrument	Vectorscope
Adjustment page	F
Adjustment address	03 (C_1 GAIN)
Specified value	Minimize the divided bright point. (Cyan, green ···Within 2.0 mm Magenta ···Within 1.0 mm Others ···Within 0.5 mm)

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 03 by the adjustment remote control.
2) Change the adjustment data to coincide each color bright point.
3) Change the adjustment address in order to store the adjustment data.

Specified Values When Vectorscope is used.

(Specified value :Cyan, Green. . . . Within 2.0mm
Magenta. . . . Within 1.0mm
Others. . . . Within 0.5mm)

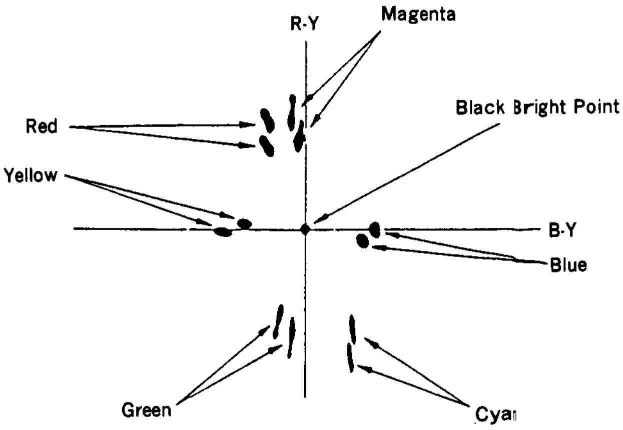


Fig. 3-19.

3-3-12. Y_H Level Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin(A6)(TP)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	08 (Y_H GAIN)
Specified value	0±5mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 08 by the adjustment remote control.
2) Change the adjustment data by the adjustment remote control in order that the output is a straght line. (There should not be difference : 0+5mV)
3) Change the adjustment address in order to store the adjustment data.

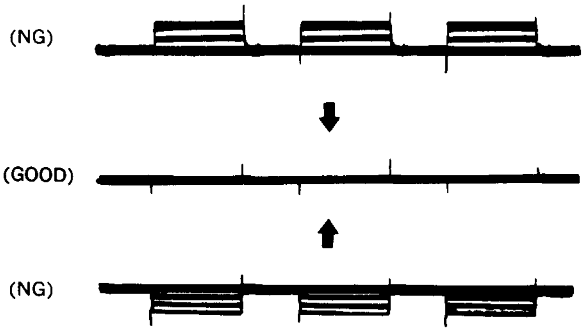


Fig. 3-20.

3-3-13. Chroma Level Adjustment (VC-67P Borad)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin(A7)(WB-G)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	11 (C LEVEL)
Specified value	320±20mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 11 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to adjust the White level to 320±20 mV.
3) Change the adjustment address in order to store the adjustment data.

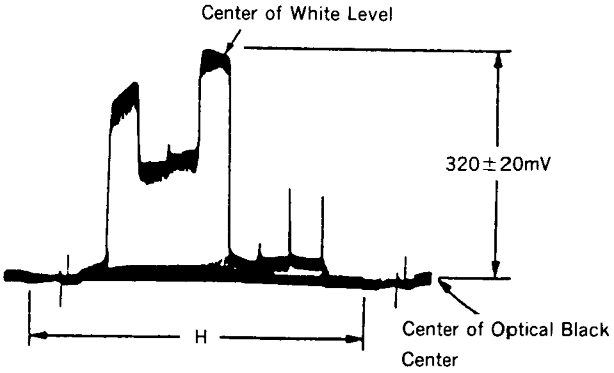


Fig. 3-21.

3-3-14. Sync. Level Adjustment (VC-67P Board)

Object	All black (Cover the lens with a black cap.)
Measurement point	CN307 pin① (Y OUT) or checkpoint array pin(A8)(CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	16 (SYNC LEVEL)
Specified value	150±5mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 16 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to adjust the sync. level to 150±5mV.
3) Change the adjustment address in order to store the adjustment data.

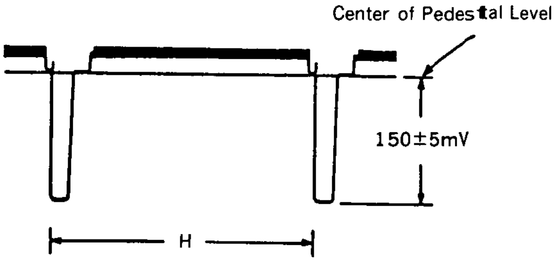


Fig. 3-22.

3-3-15. Setup Adjustment (VC-67P Board)

Object	All black (Cover the lens with a black cap.)
Measurement point	CN307 pin① (Y OUT) or checkpoint array pin(A8)(CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	10 (SET UP) 18 (MAX GAIN)
Specified value	15±5mV

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address 18 with the adjustment remote control, make note of the adjustment data of this address (data F), and then, set the adjustment data to 00.
3) Select the adjustment address 10 with the adjustment remote control.
4) Change the adjustment data with the adjustment remote control to adjust the setup level to 15±5mV.
5) Select the adjustment address 18 and enter to the adjustment data F.
6) Change the adjustment address in order to store the adjustment data.

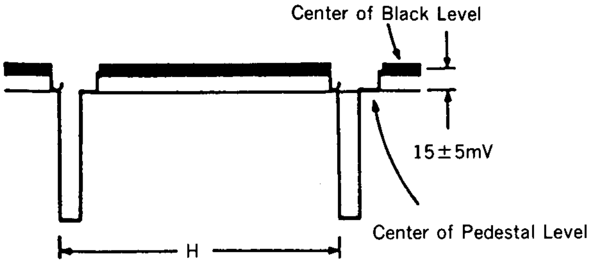


Fig. 3-23.

3-3-16. White Clip Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	CN307 pin① (Y OUT) or checkpoint array pin(A8)(CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	15 (WC) 0E (Y LEVEL)
Specified value	400±10mV

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjutment address 0E with the adjustment remote control, make note of the adjustment data of this address (data G), and then, set the adjustment data to FF.
3) Set the adjustment address to 15 with the adjustment remote control.
4) Change the adjustment data with the adjustment remote control to adjust the white clip level to 400±10mV.
5) Select the adjustment address 0E and enter to adjustment data F.
6) Change the adjustment address in order to store the adjustment data.
7) Make Y level adjustment as described in 3-3-17.

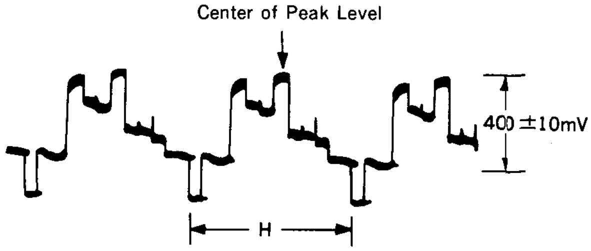


Fig. 3-24.

3-3-17. Y Level Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	CN307 pin① (Y OUT) or checkpoint array pin(A8)(CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	0E (Y LEVEL)
Specified value	330±5mV

[Adjustment Method]

1) Check that the specified value in "3-3-16 White Clip Adjustment" is met.
2) Select the adjustment page F and the adjustment address 0E with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control and adjust the Y signal level to 330±5mV.
4) Change the adjustment address in order to store the adjusment data.

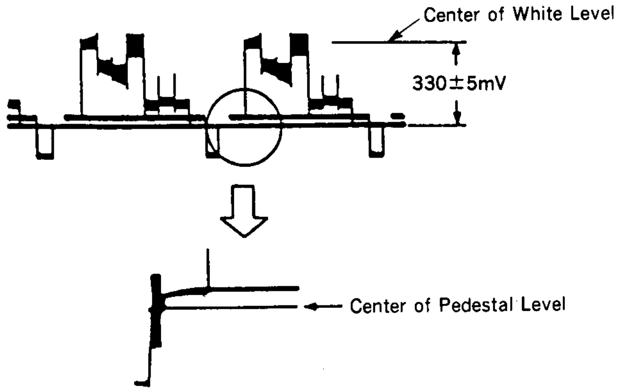


Fig. 3-25.

3-3-18. H Aperture Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Measurement point	CN307 pin① (Y OUT) or checkpoint array pin(A8)(CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	0D (SHP LEVEL)
Specified value	40±5mV

[Adjustment Method]

1) Turn the focusing ring to maximize the aperture level (waveform peak).
2) Select the adjustment page F and the adjustment address 0D with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control to set the aperture level (lower peak between "green" and "white") to a point 40±5mV above the pedestal level.
4) Change the adjustment address in order to store the adjustment data.

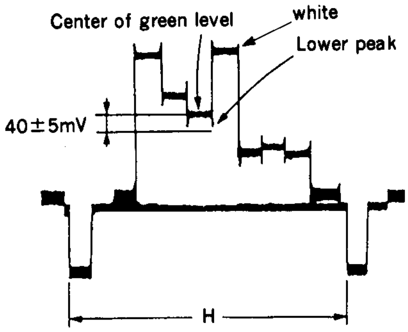


Fig. 3-26.

3-3-19. Max. Gain Adjustment (VC-67P Board)

Object	Color bar chart standard picture frame
Filter	ND filter: 1.0×2pcs., 0.4×1pc, 0.1×2pcs. each
Measurement point	CN307 pin① (Y OUT) or checkpoint array pin(A8)(CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	18 (MAX GAIN)
Specified value	145±5mV

[Adjustment Method]

1) Cover the lens with the ND filter 2.6 (1.0+1.0+0.4+0.1+0.1).
2) Select the adjustment page F and the adjustment address 18 with the adjustment remote control.
3) Change the adjustment address with the adjustment remote control to adjust the Y signal level to 145±5mV.
4) Change the adjustment address in order to store the adjustment data.

Note : Although the ND filter is combined by using 5 pcs, if your ND filter is combined by using 3 pcs or less, resulting in 2.5, this combination should be available.

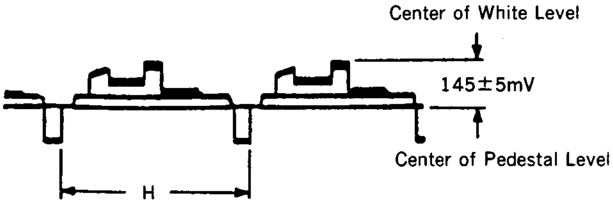


Fig. 3-27.

3-3-20. Burst Level Adjustment (VC-67P Board)

Object	All black (Cover the lens with a black cap.)
Measurement point	CN307 pin③ (C OUT) or checkpoint array pin (A10) (CAM C)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	17 (BURST LEVEL)
Specified value	150±5mVp-p

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 17 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to adjust the burst level to 150±5mVp-p.
3) Change the adjustment address in order to store the adjustment data.

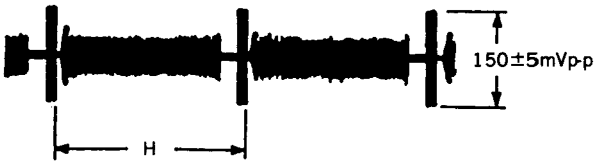


Fig. 3-28.

3-3-21. Standard AE Level Adjustment (AF-54P Board)

Object	Color bar chart standard picture frame, All black (Cover with a black cap)
Measurement point	CN801
Measuring instrument	AF microcomputer data reading jig
Adjustment page	F
Adjustment address	60 (IRIS REF-NOR) 61 (IRIS REF-PO) 62 (IRIS REF-SP)
Specified value	$(D_{60}-D_{8C})>24$ $(D_{60}-08)$

[Adjustment Method]

1) Set the adjustment page F with the adjustment remote control.
2) Set the adjustment address EB and the adjustment data 13 with the adjustment remote control.
3) Input the value of the AF microcomputer data reading jig to the adjustment address 60. (This adjustment data of the adjustment adress is set to D_{60})
4) Make all black. (Cover with a black cap)
5) Input the value of the AF microcomputer data reading jig to the adjustment address 8C. (This adjustment data of the adjustment address 8C is set to D_{8C})
6) Check that it is $(D_{60}-D_{8C})>24$. When the value of $(D_{60}-D_{8C})$ is between 21 and 24, set the adjustment data 76 from 71 and the adjustment data 05 from 06.
7) Input the value of $(D_{60}-08)$ to the adjustment address 61 and 62.

Example)

The adjustment data D_{60} of the adjustment address 60.		The input value of the adjustment address 60 and 61.
5A	⟶	52
5B	⟶	53
5C	⟶	54
⋮	⟶	⋮

8) Set the adjustment address EB and the adjustment data 00 with the adjustment remote control.
9) Change the adjustment address in order to store the adjustment data.

3-3-22. Iris Manual Data Adjustmem (AF-54P Board)

Object	White pattern standard picture frame
Measurement point	CN801
Measuring instrument	AF microcomputer data reading jig
Adjustment page	F
Adjustment address	63 (IRIS DATA 1)
Specified value	C0±01

[Adjustment Method]

1) Set the adjustment page F with the adjustment remote control.
2) Set the adjustment address EB and the adjustment data 05 with the adjustment remote control.
3) Turn off the AUTO LOCK switch (FD-15P board S217).
4) Adjust to 「F8」 with the IRIS button (FD-15P board S201).
5) Change the adjustment data of the adjustment address 63 so that the value of the AF microcomputer data reading jig is C0±01.
6) Set the adjustment address EB and the adjustment data 00 with the adjustment remote control.
7) Change the adjustment address in order to store the adjustment data.

3-3-23. Warning Display Level Setting (AF-54P Board)

Object	Color bar chart standard picture frame
Measurement point	CN801
Measuring instrument	AF microcomputer data reading jig
Adjustment page	F
Adjustment address	66 (EMG AGC)

[Setting Method]

1) Set the adjustment page F with the adjustment remote control.
2) Set the adjustment address EB and the adjustment data 0B with the adjustment remote control.
3) Turn off the AUTO LOCK switch (FD-15P board S217)
4) Adjust to 「+9dB」 with the GAIN button (FD-15P board S211).
5) Input the value of the AF microcomputer data reading jig to the adjustment address 66.
6) Set the adjustment address EB and the adjustment address 00 with the adjustment remote control.
7) Change the adjustment address in order to store the adjustment data.

3-3-24. AE Check

[Preparation]

1) Turn off the AUTO LOCK switch (FD-15P board S217.)
2) Adjust to 1/2000 with the SHUTTER SPEED button (FD-15P board S215).

Note : Be sure to check in the order of 1 → 2 → 3 → 4.

1. Portrait Mode Check (AF-54P Board)

Object	White pattern standard picture frame
Filter	ND filter 1.0
Measurement point	CN801
Measuring instrument	AF microcomputer data reading jig
Adjustment page	F
Adjustment address	8D

[Checking Method]

1) Set the adjustment page F with the adjustment remote control.
2) Set the adjustment address EB and the adjustment data 11 with the adjustment remote control.
3) Set the portrait mode with the PROGRAM AE button (FD-15P board S208).
4) Cover the lens with the ND filter 1.0
5) After three seconds, input the value of the AF microcomputer data reading jig the adjustment address 8D.
6) Change the adjustment address in order to store the adjustment data.
7) 「Sports mode Check」 should be performed.

2. Sports Mode Check (AF-54P Board)

Object	All black (Cover the lens with a black cap)
Filter	ND filter 1.0
Measurement point	CN801
Measuring instrument	AF microcomputer data reading jig
Adjustment page	F
Adjustment address	8E
Specified value	FF

[Checking Method]

1) Set the adjustment page F with the adjustment remote control.
2) Set the sports mode with the PROGRAM AE button (FD-15P board S208).
3) Cover the lens with the ND filter 1.0
4) Cover with a black cap with the ND filter 1.0 installed.
5) After two seconds, input the value of the AF microcomputer data reading jig to the adjustment address 8E.
6) After two seconds, check that the value of the AF microcomputer data reading jig is FF.
7) Check the adjustment address in order to store the adjustment data.
8) 「3. Iris preceding mode check」 should be performed.

3. Iris Preceding Mode Check (AF-54P Board)

Object	White pattern standard picture frame All black (Cover with a black cap.)
Measurement point	CN801
Measuring instrument	AF microcomputer data reading jig and a monitor screen
Adjustment page	F
Adjustment address	8F
Specified value	When the object is all black on condition of the iris F4, the ▶ mark on the monitor screen should be flashing and the value of the AF microcomputer data reading jig should be FF.

[Checking Method]

1) Set the adjustment page F with the adjustment remote control.
2) Set the iris preceding mode with the PROGRAM AE button (FD-15P board S208).
3) Adjust to 「F4」 with the CONTROL switch (FD-15P board S210).
4) After two seconds, the ▶ mark on the monitor screen should not be flashing.
5) Input the value of the AF microcomputer data reading jig to the adjustment address 8F.
6) Make all black on the condition of 「F4」 (cover with a black cap.)
7) After two seconds, check that the ▶ mark on monitor screen is flashing.
8) Check that this value of the AF microcomputer data reading jig is FF.
9) Change the adjustment address in order to store the adjustment data.
10) 「Shutter preceding mode Check」 should be performed.

4. Shutter Preceding Mode Check (AF-54P Board)

Object	All black (Cover with a black cap.)
Measurement point	CN801
Measuring instrument	AF microcomputer data reading jig and a monitor
Adjustment page	F
Specified value	The value of the AF microcomputer data reading jig should be FF.

[Checking Method]

1) Set the adjustment page F with the adjustment remote control.
2) Make all black (cover with a black cap).
3) Set the adjustment address 8F with the adjustment remote control.
4) Set the shutter preceding mode with the PROGRAM AE button (FD-15P board S208).
5) Check that the value of the AF microcomputer data reading jig is FF.
6) Check that the ▶ mark on the monitor screen is not flashing.

Note : After checking AE, set the adjustment address EB and the adjustment data 00. (Change the adjustment address in order to store the adjustment data.)

3-3-25. Pre-white Balance Adjustment (With Vectorscope)

Object	All white pattern
Measurement point	VIDEO OUT terminal of the video block
Measuring instrument	Vectorscope
Adjustment page	F
Adjustment address	05 (R GAIN) 04 (B GAIN)
Specified value	The center of a white bright point must be within a circle of ϕ 1 mm centering around the origin

[Adjustment Method]

1) Maximize the gain of vectorscope.
2) Select the adjustment page F and the adjustment address 05 with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control to coincide the white bright point with the origin.
4) Select the adjustment address 04.
5) Change the adjustment data to coincide the white bright point with the origin.
6) Repeat the steps 2) through 5).
7) Return the gain of vectorscope to CAL, and make sure that center of the bright point is located inside a circle of 1 mm diameter apart from the origin.
8) Change the adjustment address in order to store the adjustment data.

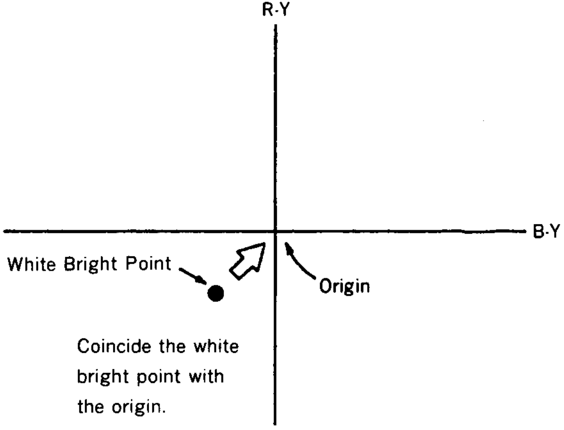


Fig. 3-29.

3-3-26. Color Reproducibility Adjustment (With Vectorscope)

Object	Color bar chart standard picture frame
Measurement point	VIDEO OUT terminal of the video block
Measuring instrument	Vectorscope
Adjustment page	F
Adjustment address	09 (R-Y GAIN) 0A (B-Y GAIN) 0B (R-Y HUE) 0C (B-Y HUE)
Specified value	All color bright points must be within a color reproduction frame.

Note : Burst level adjustment and pre-white balance adjustment must have been completed.

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Change the adjustment data of each adjustment address with the adjustment remote control to collect all the color bright points within the color reproduction frame.
3) Change the adjustment address in order to store the adjustment data.

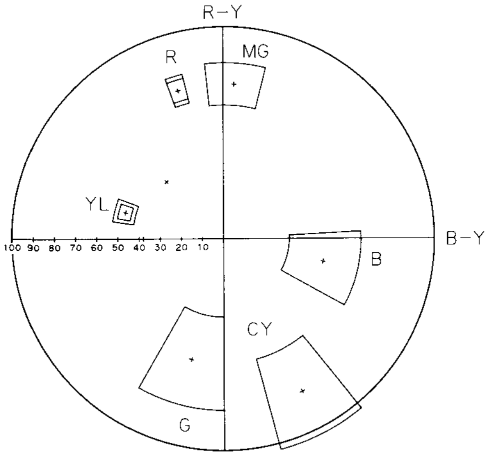


Fig. 3-30.

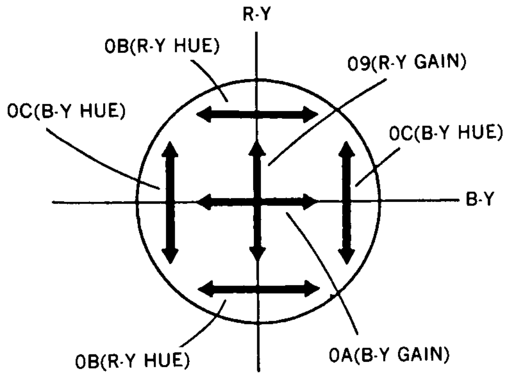


Fig. 3-31. Adjustment Addresses and Bright Point Moving Directions

3-3-27. Auto White Balance Adjustment

Note 1 : Be sure to make "preset adjustment" and "auto white balance adjustment" in that order.

(1) Preset Adjustment (VC-67P Board)

Object	White pattern standard picture frame
Adjustment page	F
Adjustment address	EE (AWB MODE 1)

Note 1 : Make preset adjustment 30 seconds or more after turning on the power.

Note 2 : When redoing preset adjustment, turn off the power once, and then, turn it on again.

[Adjustment Method]

1) Turn off/on the power.
2) Obtain a picture of white pattern for over five seconds. (AF switch is turned off.)
3) Select the adjustment page F with the adjustment remote control.
4) Select the adjustment address EE by the adjustment remote control and set the adjustment data to be 01.
5) Change the adjustment address in order to store the adjustment data. (3200K data fetch 1)
6) Select the adjustment address EE by the adjustment remote control and set the adjustment data to be 23.
7) Change the adjustment address in order to store the adjustment data. (3200K data fetch 2)
8) Check that the LANC data is changed and the adjustment address 95 is selected.
9) Select the adjustment address EE by the adjustment remote control and set the adjustment data to be 00.
10) Change the adjustment address in order to store the adjustment data.
11) Make auto white balance adjustment.

(2) Auto White Balance Adjustment (VC-67P Board)

Note 1 : Be sure to make this adjustment after preset adjustment.

Object	All white pattern
Filter	Color temperature compensation filter C14 (C12+C2)
Measuring instrument	Vectorscope
Measurement point	VIDEO OUT terminal
Adjustment page	F
Adjustment address	01 (R CONT) 02 (B CONT) 98 (START R) 99 (START B) 9A (R OUT DOOR) 9B (B OUT DOOR) A0 (Ra) A1 (Rb) A2 (Rc) A3 (Ba) A4 (Bb) A5 (Bc) A6 (R/B TOP) A7 (R/B MDL) A8 (R/B BTM) A9 (B/R TOP) AA (B/R MDL) AB (B/R BTM) B0 (TOP SLP R) B8 (TOP UP) B9 (TOP DWN) BD (R DWN LMT) BE (B DWN LMT) BF (B IN TOP) C0 (B IN MAX) C1 (B OUT MIN) C2 (B OUT DWN)
Specified value	The white and black bright points must coincide.

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address EE (AWB MODE1) with the adjustment remote control and enter the adjustment data 10. (Set of WB DIRECT)
3) Cover the lens with the C14 filter.
4) Change the adjustment data of the adjustment addresses 01 and 02 with the adjustment remote control to coincide the white bright point with the origin.
   At this time, assume the data of the adjustment address 01 as Rc14 and that of the adjustment address 02 as Bc14.
5) Input the value on the AWB adjustment data list (Refer to page 48) from the value of Rc14 and Bc14 to each address, and then proceed to the item 16). If the value does not come under the list, caluculate the adjustment data by the calculation from item 6).
6) Make that the adjustment address 01 data of the adjustment remote control on the item 4) is C1 and the adjustment address 02 data is C2.
7) Convert C_1 into a decimal number to assume it as C_1', and C_2 as well as C_2'. (Refer to Table 3-4 "Hexadecimal-Decimal Conversion Table")
8) Obtain D_{9A}' anb D_{9B}' by the following formula.
   $D_{9A}'=C_1'+2 \qquad D_{9B}'=C_2'+6$
9) Convert D_{9A}' and D_{9B}' into a hexadecimal number and assume its value as D_{9A} and D_{9B}. (Round fractions below a decimal number to the nearest whole number)
10) Select the adjustment address 9A and enter the adjustment data D_{9A}.
11) Select the adjustment address 9B and enter the adjustment data D_{9B}.
12) Obtain A and B in the hexadecimal numbers by the following formula, and convert them into the decimal numbers. The values are A′ and B′.
    $A=5A-D_{9A}$
    $B=D_{9B}-50$
13) Obtain the adjustment data of each adjustment address in the decimal numbers by the following formula.
    $D_{A0}'=90-A'\times1.12$
    $D_{A1}'=D_{9A}'$
    $D_{A2}'=90-A'\times0.593$
    $D_{98}'=D_{A2}'$
    $D_{BE}'=B'\times2+80$
    $D_{BF}'=D_{9B}'$
    $D_{C0}'=B'\times0.84+80$
    $D_{C1}'=D_{C0}'$
    $D_{C2}'=B'\times0.3+80$
    $D_{A3}'=B'\times1.34+80$
    $D_{99}'=D_{A5}'$
    $D_{A4}'=D_{9B}'$
    $D_{A5}'=B\times0.467+80$
    $D_{BD}=90-A'\times1.67$
14) The above items, calculate by decimal and input by hexadecimal.

15) The below items, calculate by hexadecimal and input the adjustment data to each adjustment address.

$$D_{A6}=\frac{(D_{A1}-D_{A0})\times 40}{(D_{A3}-D_{A4})}$$

$$D_{A7}=\frac{(D_{A2}-D_{A1})\times 40}{(D_{A4}-D_{A5})}$$

$$D_{A8}=\frac{(5A-D_{A2})\times 40}{(D_{A5}-50)}$$

$$D_{A9}=\frac{(D_{A3}-D_{A4})\times 10}{(D_{A1}-D_{A0})}$$

$$D_{AA}=\frac{(D_{A4}-D_{A5})\times 10}{(D_{A2}-D_{A1})}$$

$$D_{AB}=\frac{(D_{A5}-50)\times 10}{(5A-D_{A1})}$$

$$D_{B0}=D_{A9}$$

$$D_{B8}=\frac{(D_{A1}+0A)\times D_{B0}+D_{A4}\times 10}{40}$$

$$D_{B9}=\frac{(D_{A1}-11)\times D_{B0}+D_{A4}\times 10}{40}$$

16) Select the adjustment address EE and enter the adjustment data 00.

17) Change the adjustment address in order to store the adjustment data.

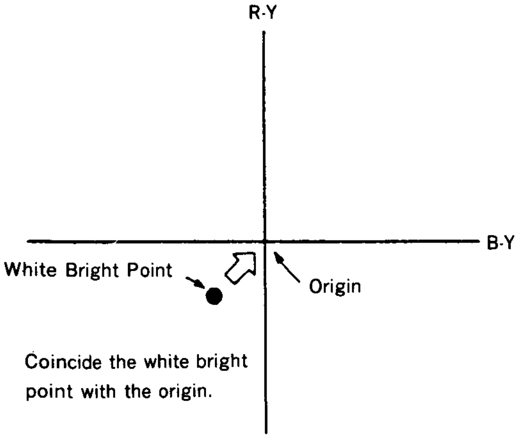

R-Y
B-Y
White Bright Point
Origin
Coincide the white bright point with the origin.

Fig. 3-32.

•AWB Adjustment Data Table

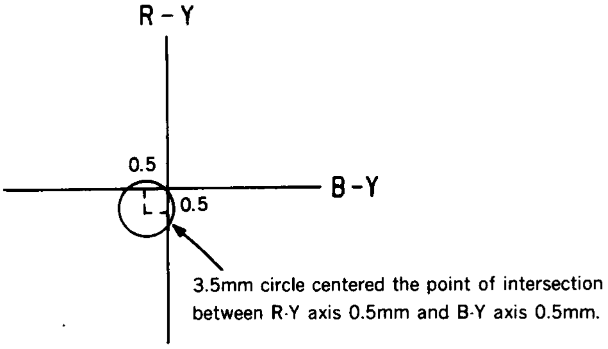
Rc14;Bc14	adr98	99	9A	9B	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	B0	B8	B9	BD	BE	BF	C0	C1	C2
3D 78	4A	65	3F	7E	3C	3F	4A	8E	7E	65	C	1C	31	55	24	15	55	81	5D	2C	AC	7E	77	77	5E
3D 79	4A	66	3F	7F	3C	3F	4A	8F	7F	66	C	1C	2F	55	24	16	55	81	5D	2C	AE	7F	77	77	5E
3D 7A	4A	66	3F	80	3C	3F	4A	90	80	66	C	1B	2F	55	26	16	55	81	5D	2C	B0	80	78	78	5E
3D 7B	4A	67	3F	81	3C	3F	4A	92	81	67	B	1B	2D	5B	26	17	5B	88	61	2C	B2	81	79	79	5F
3D 7C	4A	67	3F	82	3C	3F	4A	93	82	67	B	1A	2D	5B	27	17	5B	88	62	2C	B4	82	7A	7A	5F
3D 7D	4A	68	3F	83	3C	3F	4A	94	83	68	B	1A	2B	5B	27	18	5B	88	62	2C	B6	83	7B	7B	5F
3D 7E	4A	68	3F	84	3C	3F	4A	96	84	68	B	19	2B	60	29	18	60	8F	66	2C	B8	84	7C	7C	60
3D 7F	4A	69	3F	85	3C	3F	4A	97	85	69	B	19	29	60	29	19	60	8F	66	2C	BA	85	7D	7D	60
3D 80	4A	69	3F	86	3C	3F	4A	98	86	69	B	18	29	60	2A	19	60	8F	67	2C	BC	86	7D	7D	60
3D 81	4A	6A	3F	87	3C	3F	4A	9A	87	6A	A	18	27	65	2A	1A	65	95	6B	2C	BE	87	7E	7E	61
3D 82	4A	6A	3F	88	3C	3F	4A	9B	88	6A	A	17	27	65	2C	1A	65	96	6B	2C	C0	88	7F	7F	61
3D 83	4A	6B	3F	89	3C	3F	4A	9C	89	6B	A	17	26	65	2C	1B	65	96	6B	2C	C2	89	80	80	61
3D 84	4A	6B	3F	8A	3C	3F	4A	9E	8A	6B	A	17	26	6B	2D	1B	6B	9C	6F	2C	C4	8A	81	81	61
3D 85	4A	6C	3F	8B	3C	3F	4A	9F	8B	6C	A	17	25	6B	2D	1C	6B	9C	6F	2C	C6	8B	82	82	62
3D 86	4A	6C	3F	8C	3C	3F	4A	A0	8C	6C	A	16	25	6B	2F	1C	6B	9D	70	2C	C8	8C	82	82	62
3D 87	4A	6C	3F	8D	3C	3F	4A	A2	8D	6C	9	15	25	70	30	1C	70	A3	74	2C	CA	8D	83	83	62
3D 88	4A	6D	3F	8E	3C	3F	4A	A3	8E	6D	9	15	23	70	30	1D	70	A3	74	2C	CC	8E	84	84	63
3D 89	4A	6D	3F	8F	3C	3F	4A	A4	8F	6D	9	15	23	70	31	1D	70	A4	74	2C	CE	8F	85	85	63
3D 8A	4A	6E	3F	90	3C	3F	4A	A6	90	6E	9	15	22	75	31	1E	75	AA	78	2C	D0	90	86	86	63
3D 8B	4A	6E	3F	91	3C	3F	4A	A7	91	6E	9	14	22	76	33	1E	75	AA	79	2C	D2	91	87	87	64
3E 78	4B	65	40	7E	3D	40	4B	8E	7E	65	C	1C	2E	55	24	16	55	82	5E	2E	AC	7E	77	77	5E
3E 79	4B	66	40	7F	3D	40	4B	8F	7F	66	C	1C	2C	55	24	17	55	82	5E	2E	AE	7F	77	77	5E
3E 7A	4B	66	40	80	3D	40	4B	90	80	66	C	1B	2C	55	26	17	55	83	5F	2E	B0	80	78	78	5E
3E 7B	4B	67	40	81	3D	40	4B	92	81	67	B	1B	2A	5B	26	19	5B	89	63	2E	B2	81	79	79	5F
3E 7C	4B	67	40	82	3D	40	4B	93	82	67	B	1A	2A	5B	27	19	5B	89	63	2E	B4	82	7A	7A	5F
3E 7D	4B	68	40	83	3D	40	4B	94	83	68	B	1A	28	5B	27	1A	5B	8A	63	2E	B6	83	7B	7B	5F
3E 7E	4B	68	40	84	3D	40	4B	96	84	68	B	19	28	60	29	1A	60	90	68	2E	B8	84	7C	7C	60
3E 7F	4B	69	40	85	3D	40	4B	97	85	69	B	19	26	60	29	1B	60	90	68	2E	BA	85	7D	7D	60
3E 80	4B	69	40	86	3D	40	4B	98	86	69	B	18	26	60	2A	1B	60	91	68	2E	BC	86	7D	7D	60
3E 81	4B	6A	40	87	3D	40	4B	9A	87	6A	A	18	25	65	2A	1C	65	97	6C	2E	BE	87	7E	7E	61
3E 82	4B	6A	40	88	3D	40	4B	9B	88	6A	A	17	25	65	2C	1C	65	97	6C	2E	C0	88	7F	7F	61
3E 83	4B	6B	40	89	3D	40	4B	9C	89	6B	A	17	24	65	2C	1D	65	97	6D	2E	C2	89	80	80	61
3E 84	4B	6B	40	8A	3D	40	4B	9E	8A	6B	A	17	24	6B	2D	1D	6B	9E	71	2E	C4	8A	81	81	61
3E 85	4B	6C	40	8B	3D	40	4B	9F	8B	6C	A	17	22	6B	2D	1E	6B	9E	71	2E	C6	8B	82	82	62
3E 86	4B	6C	40	8C	3D	40	4B	A0	8C	6C	A	16	22	6B	2F	1E	6B	9E	71	2E	C8	8C	82	82	62
3E 87	4B	6C	40	8D	3D	40	4B	A2	8D	6C	9	15	22	70	30	1E	70	A5	76	2E	CA	8D	83	83	62
3E 88	4B	6D	40	8E	3D	40	4B	A3	8E	6D	9	15	21	70	30	1F	70	A5	76	2E	CC	8E	84	84	63
3E 89	4B	6D	40	8F	3D	40	4B	A4	8F	6D	9	15	21	70	31	1F	70	A5	76	2E	CE	8F	85	85	63
3E 8A	4B	6E	40	90	3D	40	4B	A6	90	6E	9	15	20	75	31	20	75	AC	7A	2E	D0	90	86	86	63
3E 8B	4B	6E	40	91	3D	40	4B	A7	91	6E	9	14	20	75	33	20	75	AC	7A	2E	D2	91	87	87	64
3F 78	4B	65	41	7E	3E	41	4B	8E	7E	65	C	1A	2E	55	28	16	55	84	60	30	AC	7E	77	77	5E
3F 79	4B	66	41	7F	3E	41	4B	8F	7F	66	C	1A	2C	55	28	17	55	84	60	30	AE	7F	77	77	5E
3F 7A	4B	66	41	80	3E	41	4B	90	80	66	C	19	2C	55	2A	17	55	84	60	30	B0	80	78	78	5E
3F 7B	4B	67	41	81	3E	41	4B	92	81	67	B	19	2A	5B	2A	19	5B	8B	64	30	B2	81	79	79	5F
3F 7C	4B	67	41	82	3E	41	4B	93	82	67	B	18	2A	5B	2B	19	5B	8B	65	30	B4	82	7A	7A	5F
3F 7D	4B	68	41	83	3E	41	4B	94	83	68	B	18	28	5B	2B	1A	5B	8B	65	30	B6	83	7B	7B	5F
3F 7E	4B	68	41	84	3E	41	4B	96	84	68	B	17	28	60	2D	1A	60	92	69	30	B8	84	7C	7C	60
3F 7F	4B	69	41	85	3E	41	4B	97	85	69	B	17	26	60	2D	1B	60	92	69	30	BA	85	7D	7D	60
3F 80	4B	69	41	86	3E	41	4B	98	86	69	B	16	26	60	2E	1B	60	92	6A	30	BC	86	7D	7D	60
3F 81	4B	6A	41	87	3E	41	4B	9A	87	6A	A	16	25	65	2E	1C	65	99	6E	30	BE	87	7E	7E	61
3F 82	4B	6A	41	88	3E	41	4B	9B	88	6A	A	15	25	65	30	1C	65	99	6E	30	C0	88	7F	7F	61
3F 83	4B	6B	41	89	3E	41	4B	9C	89	6B	A	15	24	65	30	1D	65	99	6E	30	C2	89	80	80	61
3F 84	4B	6B	41	8A	3E	41	4B	9E	8A	6B	A	15	24	6B	32	1D	6B	A0	73	30	C4	8A	81	81	61
3F 85	4B	6C	41	8B	3E	41	4B	9F	8B	6C	A	15	22	6B	32	1E	6B	A0	73	30	C6	8B	82	82	62

3-3-28. Outdoor White Balance Check

Object	White pattern standard picture frame
Filter	Color temperature compensation filter C14 (C12+C2)
Measurement point	VIDEO OUT terminal of the video block
Measuring instrument	Vectorscope
Specified value	Refer to Fig 3-33.

[Check Method]

1) Press the White Balance button to select the outdoor white balance mode. (A mark "☀" appears on the EVF screen or monitor screen (when the data screen is turned on)).
2) Check that the center of the white bright point is within the circumference shown in Fig. 3-33.



3.5mm circle centered the point of intersection between R-Y axis 0.5mm and B-Y axis 0.5mm.

Fig. 3-33.

3-3-29. Focus Motor Speed Adjustment (AF-54P Board)

Object	Optional
Measurement point	Focus ring
Measuring instrument	Stopwatch
Adjustment page	F
Adjustment address	30 (LOW F SPEED)
Specified value	2.7±0.1 second

Reference: A rotation time is about 2.7 seconds from the focusing ring short distance end to long distance end after completing adjustment.

[Adjustment Method]

1) Press the FOCUS button (FD-15P board S212) to turn on auto focus.
2) Select the adjustment page F with the adjustment remote control.
3) Select the adjustment address EB with the adjustment remote control and enter adjustment data 01. (setting of the hunting mode)
4) Set the adjustment address to 30.
5) A rotation time is about 2.7 seconds from the focusing ring short distance end to long distance end.
6) Repeat the step 5) 10 times and obtain an average value. Specified value=2.7±0.1 second.
   When the specified value is not met, repeat the step and 5).
7) Set the adjustment address to EB and the adjustment data to 00. (cancellation of the hunting mode)
8) Change the adjustment address in order to store the adjustment data.

3-3-30. Macro Area Adjustment (AF-54P Board)

Object	Optional
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig (AF jig)
Adjustment page	F
Adjustment address	37 (ZOOM-POSI 4)
Specified value	AF microcomputer data reader jig data : H+4

[Adjustment Method]

1) Set the zoom ring at the WIDE end.
2) Select the adjustment page F with the adjustment remote control.
3) Select the adjustment address EB with the adjustment remote control and set the adjustment data to C3.
4) Set the adjustment address 37 with the adjustment remote control, an note down the data of the AF jig. (This data is H.)
5) Input the value of (H+4) to the adjustment data.
6) Change the adjustment address to EB and set the adjustment data to 00.
7) Change the adjustment address in order to store the adjustment data.

(Example)

AF microcomputer data jig		Input value
07	⟶	0B
06	⟶	0A
⋮		⋮

3-3-31. Auto Focus Adjustment

(1) Preparation for AF Data Entry (AF-54P Board)

Object	All black (Cover the lens with a black cap), all white pattern
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig (AF jig)
Adjustment page	F
Adjustment address	2B (FH BM) 29 (FA BM) 46 (AGC B) 2A (FH WM) 45 (AGC W)
Specified value	FH WM≦28

[Adjustment Method]

1) Turn off auto focus with the FOCUS button (FD-15P board S212).
2) Cover the lens with a black cap.
3) Select the adjustment address EB with the adjustment remote control and set the adjustment data to ED.
4) Read the AF microcomputer data reader jig add +3 and enter this data (FH BM) to the adjustment address 2B.
5) Select the adjustment address EB and set the adjustment data to EF.
6) Read the AF microcomputer data reader jig add +3 and enter this data (FA BM) to the adjustment address 29.
7) Select the adjustment address EB and set the adjustment data 0B.
8) Read the AF microcomputer data reader jig and enter this data (AGC B) to the adjustment address 46.
9) Remove the black cap from the lens and pick up an image with a white pattern (pattern box). (When this is done, check that the white diffusion plate for the pattern box is not dirty.)
10) Select the adjustment address EB and set the adjustment data to ED.
11) Read the AF microcomputer data reader jig and enter this data (FH WM) to the adjustment address 2A. (FH WM≦28)
12) Select the adjustment address EB and set the adjustment data to 0B.
13) Read the AF microcomputer data reader jig and enter this data (AGC W) to the adjustment address 45.
14) Select the adjustment address EB and set the adjustment data to 00.
15) Change the adjustment address in order to store the adjustment data.

(2) Auto Focus Check (AF-54P Board)

Object	Siemens star (1.5m in front of the lens datum level (marked by "ϕ"))
Filter	ND filter 1.0×1 pcs., 0.1×2 pcs.
Measurement point	Focus ring
Measuring instrument	Focus ring
Specified values	The focus ring stops at 2 to 3 of the index.

[Measurement method]

1) Place a Siemens star at 1.5m from the lens standard surface (See to Fig. 3-2)
2) Set the zoom lever to the TELE end (80mm) and turn off the auto focus with the FOCUS button (FD-15P board S212).
3) Adjust the camera position so that the center of the Siemens star on the monitor is correspond to the center of the screen.
4) Cover the lens with the ND filter 1.2.

5) Set the focus ring at short range end (1.1m). Make a picture of the Siemens star in the standard frame and turn on the auto focus with the focus button.
6) After 2.0 seconds, confirm that the picture of Siemens star is taken clearly. Turn off the auto focus with the focus button.

Note : In the case of New microcomputer (after MC68HC11E9-SC400188), perform the following adjustment method.

1) Cover the lens with black cap and make all black.
2) Set the zoom lever to the WIDE end, and turn off the auto focus with the FOCUS button.
3) Set the focus ring to ∞ and turn on the auto focus.
4) Confirm that the focus ring stops within the range of index 2 to 3.

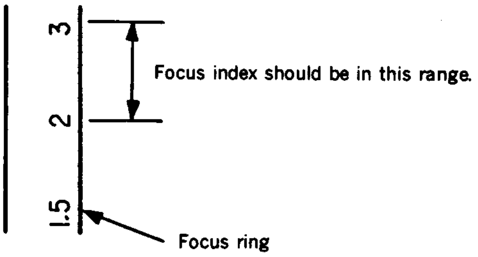


Fig. 3-34

3-3-32. Auto Focus Measuring distance Check

Object	Siemens star (at a distance of 1.5m in front of the lens datum level (marked by "ϕ"))

Note 1 : Connect the EVF (Electronic View Finder) to make adjustment.

[Measurement Methed]

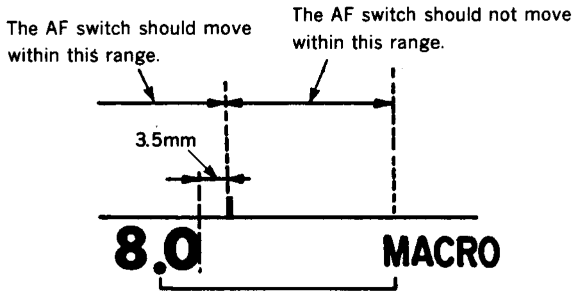
1) Place the Siemens star at a distance of 1.5m in front of the lens datum level (refer to Fig. 3-2).
2) Cover the ND filter 1.2.
3) Shift the zoom lever to the TELE end (80mm).
4) Adjust a camera block position to center the Siemens star on the monitor screen with the monitor screen.
5) Turn off auto focus with the FOCUS button (FD-15P board S212).
6) Turn the focusing ring as far as the short distance end (1.1m).
7) Press the PUSH AUTO button (FD-15P board S213).
8) After 2 seconds, check that a clear image can be obtained.
9) Turn off auto focus and turn the focusing ring as far as the long distance end (∞).
10) Press the PUSH AUTO button.
11) After 3 seconds, check that a clear image can be obtained.

3-3-33. AF-Zooming Check

Object	All white pattern
Measurement point	Lens focusing ring or zoom ring
Specified value	Refer Fig. 3-35.

[Checking Method]

1) Obtain a picture of all white pattern by the WIDE end. And check that turning off and on the auto focus with the FOCUS switch (FD-15P board S212) permits the operation of both ends of the short distance end (1.1m) and the long distance end (on) over one operation.
2) After setting the Zoom lever in the MACRO range as shown in the figure, check that the focus ring does not move when the focus switch is turned ON and OFF, and turned ON again.


The AF switch should move within this range.
The AF switch should not move within this range.
3.5mm
8.0
MACRO

(After pushing fully the zoom lever to the MACRO point, put it back to the position in the figure.)

Fig. 3-35.

3-4. DIGITAL TITLER SYSTEM ADJUSTMENT

3-4-1. Chroma Phase/Gain Adjustment (FD-15P Board)

Mode	CAMERA Standby
Object	All Black (Cover the lens with a black cap.)
Measurement point	VIDEO OUT terminal
Measuring instrument	Vectorscope
Adjustment element	RV301
Specified value	Adjust Mg (Magenta) to the specified range. (Check that other colors are also in the specified range.)

[Adjustment Method]

1) Cover the lens of the camera with a black cap.
2) Press the TITLE 1. button (FD-15P board S202).
3) Select Mg (Magenta) pressing the COLOR/MODE button (FD-15P board S205).
4) Display the title on the whole screen pressing the MEMORY button (FD-15P board S204).
5) The specified range should be satisfied with RV301 at this time.
6) Check that the specified range of the other colors are also satisfied.

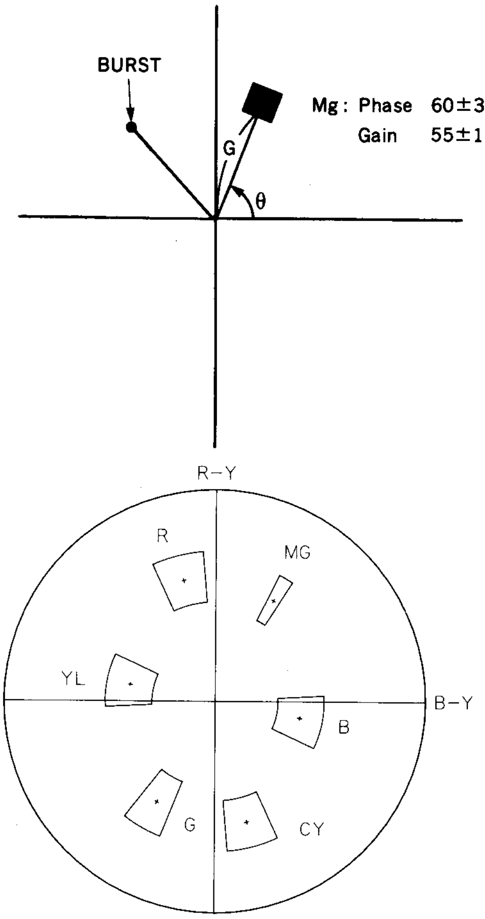


Fig. 3-36.

3-4-2. Fader Level Adjustment (VC-67P Board)

Object	All black (Cover the lens with a black cap)
Measurement point	Checkpoint array A8 pin (CAM Y) or CN307 pin ① (Y OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	1D (FADER LEVEL) 1F (FADER CONT)
Specified value	240±5mVp-p

[Adjustment Method]

1) Select the adjustment address 1F with the adjustment remote control and pre-set the adjustment data to FF.
2) Set the adjustment address to 1D with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control to adjust the fader level to 240±5mVp-p.
4) Select the adjustment address 1F with the adjustment remote control and set the adjustment data to 00.
5) Change the adjustment address in order to store the adjustment data.

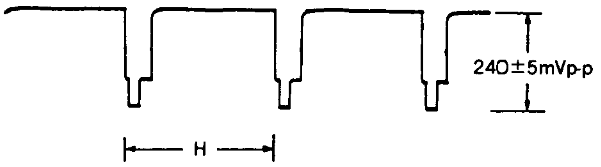


Fig. 3-37.

SECTION 4
ELECTRICAL ADJUSTMENT

See the adjusting part location diagram from on page 84 for the adjustment

4-1. PREPARATION FOR ADJUSTMENT

4-1-1. Equipment Required

The following measuring instruments are used for adjustment of the VTR block.

1) Monitor TV
2) Dual-trace oscilloscope, band width of 10MHz or more, with delay mode (use a probe 10 : 1, unless otherwise specified)
3) Frequency counter
4) Pattern generator (with video output terminal ; refer to 4-1-3 "Equipment Connection")
5) Digital voltmeter
6) Audio generator
7) Auido level meter
8) Audio distortion meter
9) Audio attenuator
10) Stabilized power supply
11) Alignment tape
    - For tracking adjustment
      (WR5-1CP) Part No. : 8-967-995-07
    - For video frequency characteristic adjustment
      (WR5-7CE) Part No. : 8-967-995-18
    - For L mode operation check
        - For SP (WR5-5CSP) Part No. : 8-967-995-46
          (WR5-4CSP) Part No. : 8-967-995-47
        - For LP (WR5-4CL) Part No. : 8-967-995-56
    - For E mode operation check (ME tape)
        - For SP (WR5-8CSE) Part No. : 8-967-995-48
        - For LP (WR5-8CLE) Part No. : 8-967-995-57

4-1-2. Precaution for Adjustment

Except "battery down adjustment" of system control system adjustment, "Switching position adjustment" of servo system adjustment the video block can be also adjusted with the camera block removed. When removing the camera block, disconnect the following 5 connectors.

1. DC-DC converter 2 pin connector (connect the FU-71P board. CN101)
2. VC-67P board CN305
3. VC-67P board CN307
4. SW-120P board CN701
5. SW-120P board CN702

The Index block (CC-33P board) is required only for time code system adjustment. When removing the time code block, disconnect the following connectors of the SS-133 board.

1. CN007 (Connect the CC-33P board W901 (pin ① to pin ⑯))
2. CN009 (Connect the CC-33P board W901 (pin ⑰ to pin ㉞))

The audio system (AU-60P board) is not required for video block adjustment. When removing the AU-60P board, disconnect the following connectors.

1. VA-62 board CN551

Set the following menu as follows :
(Mode set)

- Hi8······················AUTO
- REMOTE ················ON
- EDIT ······················ON
- BILINGUAL ·········OFF

4-1-3. Equipment Connection

Connect the measuring instruments as shown in Fig. 4-1 in accordance with indication of an input terminal (S VIDEO or VIDEO), and shift the CAMERA/VTR switch (FK-46 board S509) to VTR to make adjustment. The input terminal is specified in parentheses at the signal blank. When not specified, either input terminal may be used. The S VIDEO IN terminal has priority. When making adjustment with VIDEO IN terminal input, pull out a connector from the S VIDEO IN terminal.

Note 1 : When VIDEO input is used for adjustment where S VIDEO input is specified, the specifications of this equipment may not be satisfied. Be sure to follow instructions.

Note 2 : When adjustment is made using the VTR with S video output terminal as a signal source, the performance of this equipment is affected by that VTR. Use the pattern generator with Y/C separator output terminal as much as possible.

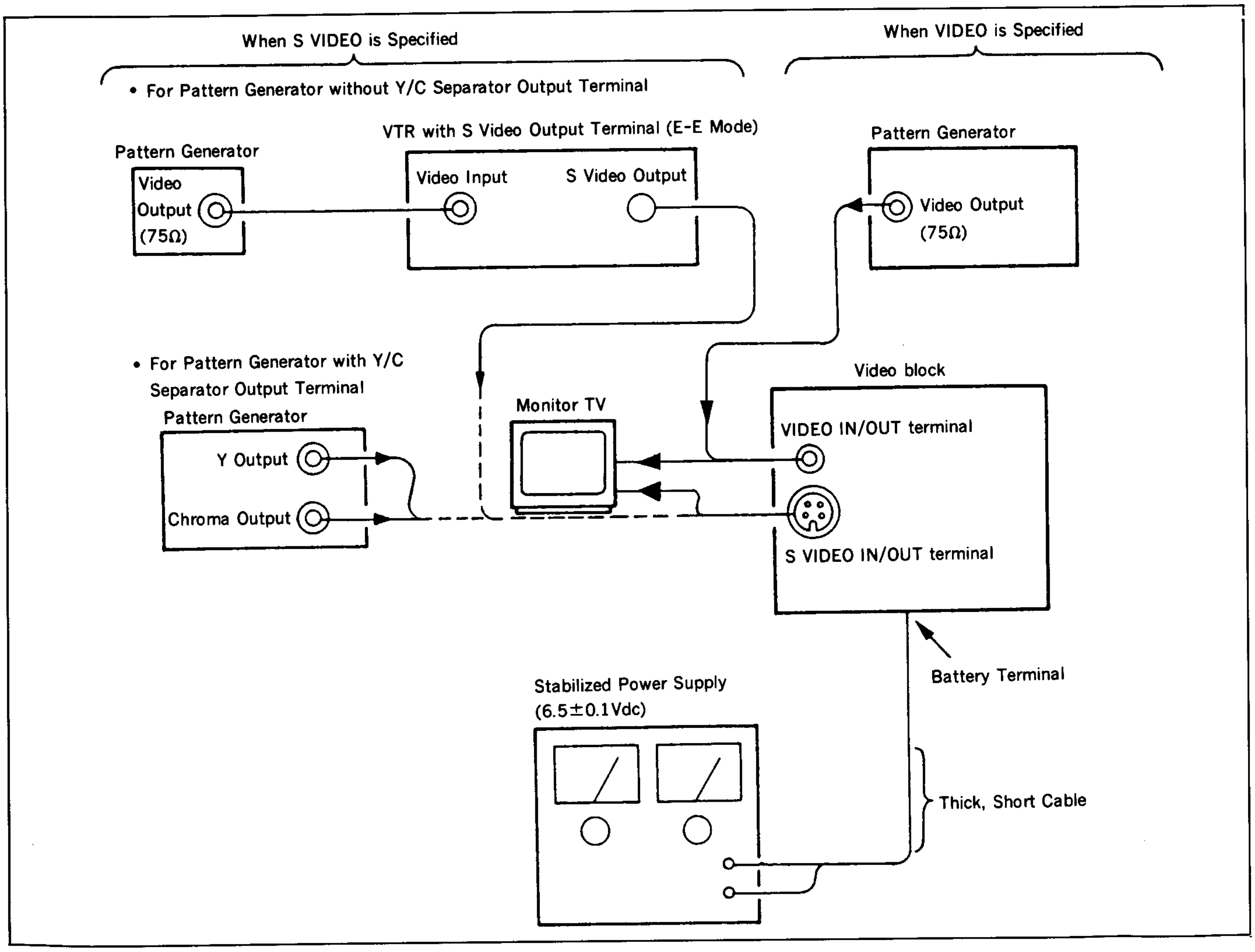

When S VIDEO is Specified
• For Pattern Generator without Y/C Separator Output Terminal
Pattern Generator
Video Output (75Ω)
VTR with S Video Output Terminal (E-E Mode)
Video Input
S Video Output
When VIDEO is Specified
Pattern Generator
Video Output (75Ω)
• For Pattern Generator with Y/C Separator Output Terminal
Pattern Generator
Y Output
Chroma Output
Monitor TV
Video block
VIDEO IN/OUT terminal
S VIDEO IN/OUT terminal
Battery Terminal
Stabilized Power Supply (6.5±0.1Vdc)
Thick, Short Cable

Fig. 4-1 (a).

Note 3 : When inputting in the "CAMERA" mode, set the CAMERA/VTR switch (FK-46 board S509) to be in the "CAMERA" mode and input the color bar in the procedure as shown in Fig. 4-1 (b).

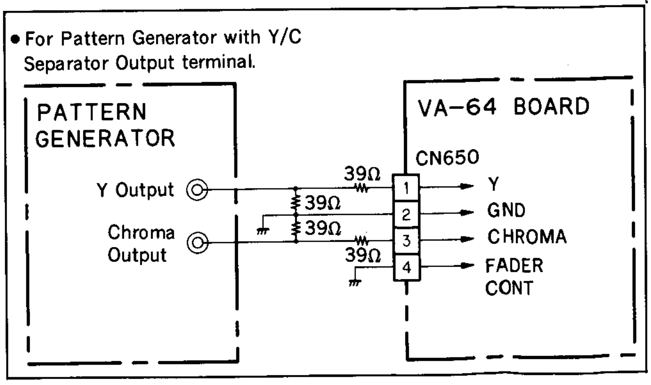

• For Pattern Generator with Y/C Separator Output terminal.
PATTERN GENERATOR
Y Output
Chroma Output
39Ω
39Ω
39Ω
39Ω
VA-64 BOARD
CN650
1
2
3
4
Y
GND
CHROMA
FADER CONT

Fig. 4-1 (b).

4-1-4. Input Signal Check

Video signals from the pattern generator are used as adjustment signals for adjustment of the VTR block. These video output signals should be within the required standard.

1) For S VIDEO input

Connect an oscilloscope to the Y signal terminal of the S VIDEO IN terminal (VA-62 board J650) and check that a Y signal sync. signal has an amplitude of about 0.3 Vp-p, and an image amplitude is about 0.7 Vp-p. (When the VTR with S video output terminal is used, check also that neither chroma signal nor burst signal is remaining.) Also, connect the oscilloscope to the chroma signal terminal of the S VIDEO IN terminal and check that the burst signal for the chroma signal has a flat amplitude of about 0.3 Vp-p, and that a burst signal vs. chroma signal amplitude ratio is 0.30 : 0.66. Fig. 4-2 shows the Y and chroma signals used for adjustment.

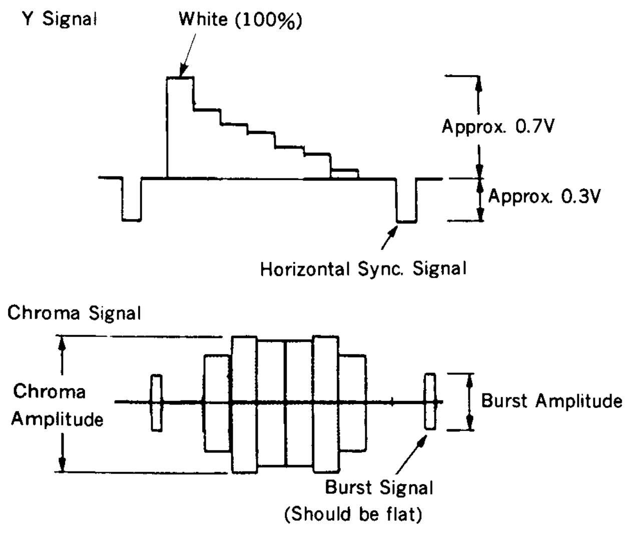

Y Signal
White (100%)
Approx. 0.7V
Approx. 0.3V
Horizontal Sync. Signal
Chroma Signal
Chroma Amplitude
Burst Amplitude
Burst Signal
(Should be flat)

Fig. 4-2. Pattern Generator Color Bar Signals

2) For VIDEO input

Connect the oscilloscope to the VIDEO IN terminal (VA-62 board J650) and check that a video signal sync. signal amplitude is approx. 0.3V, image amplitude approx. 0.7V, and burst signal amplitude approx. 0.3V and flat, respectively, and that a burst signal vs. "red" signal level ratio is 0.30 : 0.66.

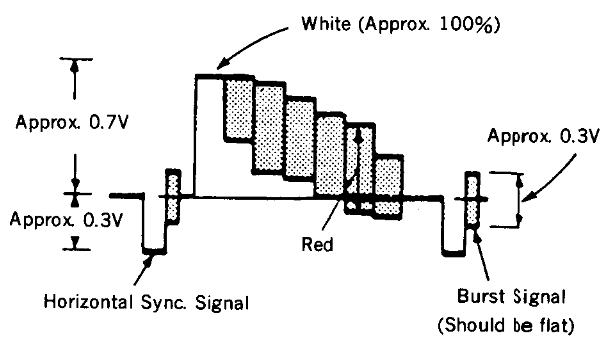

White (Approx. 100%)
Approx. 0.7V
Approx. 0.3V
Approx. 0.3V
Red
Horizontal Sync. Signal
Burst Signal
(Should be flat)

Fig. 4-3. Pattern Generator Color Bar Signal

[Alignment Tape]

The following alignment tapes are provided. Use the alignment tape specified in the signal blank for each adjustment. When using the operation checking tape for adjustment and no type is specified, you can use any operation checking tape.

Tape	Recording Mode	Tape Type	Tape Speed	Recording content		Use
				Video Area	PCM Area (Audio)	
Tracking WR5-1CP	L	MP	SP	CH2 : 1 MHz tape path adjustment signal, Switching position adjustment marker (CH1 : 9MHz)		Tape path adjustment, Switching position adjustment
Video frequency characteristic WR5-7CE	E	ME	LP	RF sweep 0~15MHz Marker 2, 4.5, 7, 8.5, 10MHz		Frequency characteristic adjustment
Operation checking WR5-3CSP or WR5-5CSP	L	MP	SP	• Video signal Color bar : 4min. Monoscope : 4min. • Audio signal (AFM) 400Hz, 60%modulation	Monoscope portion 20Hz, 20sec. 400Hz, 20sec. Repeat 4 times 14kHz, 20sec. Color bar portion 1kHz, 4min.	Operation checking
WR5-8CSE	E	ME	SP		400Hz, 8min	
WR5-3CL	L	MP	LP	• Video signal Color bar : 4min. Monoscope : 4min. • Audio signal (AFM) 400Hz, 60%modulation		
WR5-8CLE	E	ME	LP		400Hz, 8min	

Note : Recording modes

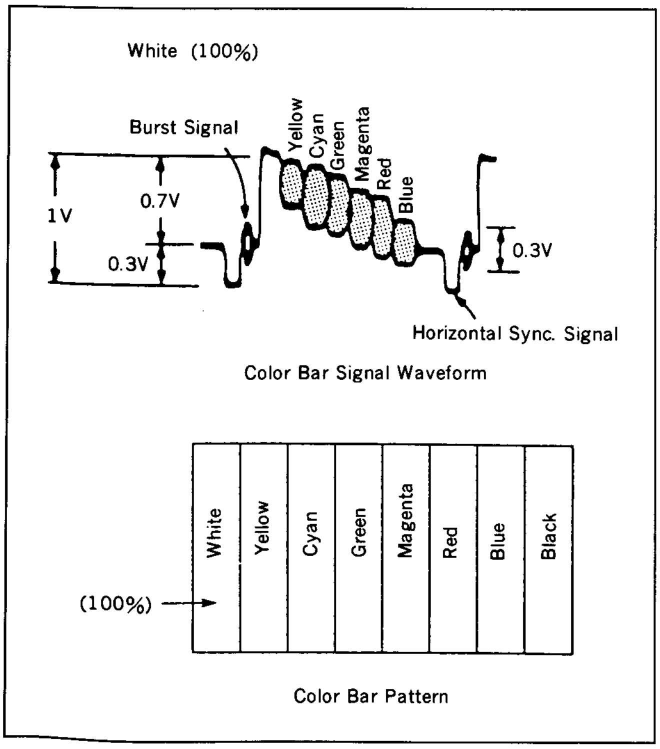
L .... Conventional mode
E .... hi8 (high band) mode

Tape types

MP .... Coated metal tape
ME .... Evaporated metal tape

Fig. 4-4 shows the color bar signal recorded in the alignment tape.

Note : Measure at the VIDEO OUT terminal (terminated at 75Ω).



Color Bar Signal Waveform

Color Bar Pattern

Fig. 4-4. Alignment Tape Color Bar Signal

[I/O Level and Impedance]

Video output	phono jack	
	Output signal :	1 Vp-p, 75Ω unbalance, sync. negative
S video output	(4-pin mini-DIN)	
	Luminance signal :	1 Vp-p, 75Ω unbalance, sync. negative
	chroma signal :	0.3 Vp-p, 75Ω unbalance
Audio output	phono jack	
	Specified output :	−7.5dBs (at 47kΩ load)
	Output impedance :	2.2kΩ or less

4-1-5. Recording Mode (E Mode/L Mode) Changeover

The recording mode of this equipment is changed over as shown in the table below. The playback mode (E mode/L mode) is automatically changed over depending on the recording mode for the tape to be played back.

Menu Mode set [Hi8] (L Model/E Model Selector Menu)	CAMERA/VTR Power Switch (FK-46 Board S509)	S VIDEO IN Terminal (VA-62 Board J651)	Tape Used	Recording Mode
AUTO (E mode)	CAMERA	Irrelevant	ME	E
			MPHG	
			MP	L
	VTR	Connector inserted	ME	E
			MPHG	
			MP	L
		Nothing inserted	ME	L
			MPHG	
			MP	
OFF (L mode)	Irrelevant	Irrelevant	ME	L
			MPHG	
			MP	

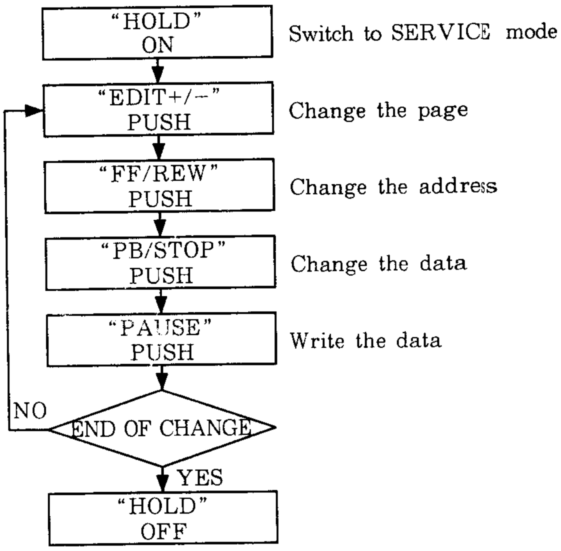
4-1-6. To Set the AEP, UK Model to REC Mode

1. Make the set CAMERA section connected.
2. Enter SERVICE mode with the adjustment remote control. (Refer to page 4 for details.)
3. Set the data at address: 00 on page: 1 to 01 * 1.
4. Set the data at address: 02 on page: D to 03 * 1
5. Turn the power of the set off.
6. Turn the power of the set on.
7. Make shorting once for S510 land of FK-46 board.

After voltage measurement and adjustment, restore as follows:

1. Set the data at address: 00 on page: 1 to 01 * 1.
2. Set the data at address: 02 on page: D to 02 * 1.
3. Turn the power of the set off.

*1 [To change the data]


"HOLD" ON
Switch to SERVICE mode
"EDIT+/−" PUSH
Change the page
"FF/REW" PUSH
Change the address
"PB/STOP" PUSH
Change the data
"PAUSE" PUSH
Write the data
NO
END OF CHANGE
YES
"HOLD" OFF

4-2. POWER SUPPLY CHECK

4-2-1. Supply Voltage Check (FU-71P Board)

Mode	E-E
Measuring instrument	Digital voltmeter
SS 5V check	
Measurement point	CN102 pin ⑫
Specified value	5.00±0.15Vdc
VI 5V check	
Measurement point	CN102 pin ⑳
Specified value	5.00±0.15Vdc
AUDIO 5V check	
Measurement point	CN102 pin ⑭
Specified value	5.00±0.15Vdc
EVF 5V check	
Measurement point	CN102 pin ⑬
Specified value	5.00±0.15Vdc

[Check Method]

1) Each supply voltage must meet its specified value.

4-3. SYSTEM CONTROL SYSTEM ADJUSTMENT

4-3-1. Battery Down Adjustment

Mode	CARERA REC
Signal	Unnecessary
Measurement point	Display on the adjustment remote control
Measuring instrument	Adjustment remote control
Adjustment Page	D
Adjustment address	06
Specified value	d: 7d:05 (reference value) Note: Actually, exact data of 5.5V_{DC} of page D address 06 is written.

[Connection]

1) Make the set MIC board, EVF board, and CAMERA section connected.
2) Connect the adjustment remote control to the REMOTE terminal.
3) Connect the digital voltmeter so to measure the voltage of the stabilized power supply unit connected to the battery terminal.

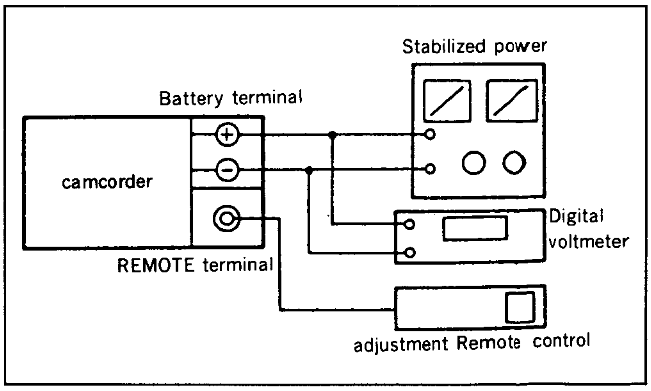
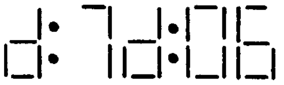


Fig. 4-5.

[Adjustment Method]

1) Turn on the POWER switch. (CAMERA mode)
2) Adjust the output of the stabilized power supply unit to be 5.58±0.01 V_{DC} (battery terminal voltage).
3) Turn on the CAMERA REC mode.
4) Set the HOLD switch of the remote control for adjustment to the HOLD side.
5) Press once the EDIT SEARCH (+) button of the adjustment commander select page 1, select data 01 of address 00, and release the protector.
6) Press four times the EDIT SEARCH (−) button of the remote control for adjusment. (Set the adjustment page to D.)
7) Be sure to set the adjustment address 06 with FF or REW button of the remote control for adjustment, and press the PAUSE button.



(reference value)

8) Turn off the POWER switch.

[Checking Method]

1) Turn on the power.
2) Adjust the output of the stabilized power source to be 5.66±0.01V_{DC}.
3) Set the camera REC mode.
4) After five seconds,TALLY should flash at 0.8Hz. (Battery Pre End)
5) Adjust the output of the stabilized power source to be 5.58±0.01V_{DC}.
6) Set the camera REC mode.
7) After five seconds, STOP mode should be set and TALLY should flash a 3.2Hz. (Battery END)

4-3-2. Clock Accuracy Adjustment (FD-15P Board)

Mode	E-E
Signal	Unnecessary
Measurement point	IC201 pin (69)
Measuring instrument	Ocsilloscope Freguency counter
Adjustment element	CT201
Specified value	512.003±0.001Hz

Note: Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

[Adjustment Method]

1) Adjust to 512.003±0.001Hz with CT201.

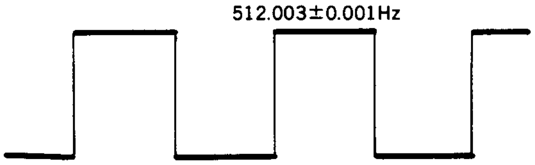


Fig. 4-6.

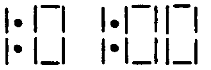
4-4. SERVO SYSTEM ADJUSTMENT

4-4-1. Switching Position Adjustment (SS-133 Board)

Mode	Playback
Signal	Alignment tape: Operation check (WR5-1NP)
Measurement point	CH1: CN200 pin ④ (RF SWP) CH2: CN200 pin ③ (RF OUT)
Measuring instrument	Oscilloscope
Adjustment page	D
Adjustment address	05 04
Specified value	$t_1=0\pm5\mu sec$ $t_2=0\pm5\mu sec$

[Adjustment Method]

1) Set the HOLD switch of the remote control for adjustment to the HOLD side. (ADJUST MODE is set.)
2) Select page 1 with the remote control for adjustment and select adjustment data 01 of adjustment address 00. (Protector is released.)



3) Press four times the EDIT SEARCH (—) button of the remote control for adjustment. (Adjustment page D is set.)
4) Select the adjustment address to 05 in order to change the adjustment data, and adjust to $t_1=0\pm5\mu sec$.
5) Press the PAUSE button in order to store the adjustment data.

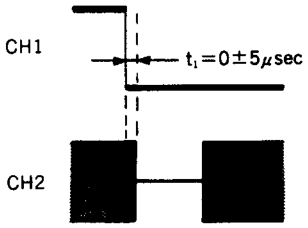


Fig. 4-7.

6) Select the adjustment address 04 in order to change the adjustment data and adjust to $t_2=0\pm5\mu sec$.

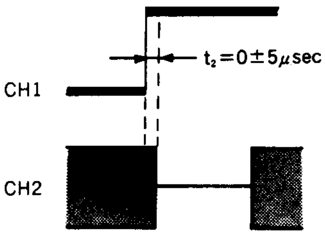


Fig. 4-8.

7) Press the PAUSE button in order to store the adjustment data.

4-4-2. Oscillation Frequency Adjustment (FU-71P Board)

Mode	Record
Signal	Unnecessary
Measurement point	Q102 collector
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	RV102
Specified value	400±2kHz

Note: Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

[Adjustment Method]

1) Adjust to 400±2kHz with RV102.

4-4-3. Output Voltage Adjustment (FU-71P Board)

Mode	Record
Signal	Unnecessary
Measurement point	(+) side: CN102 pin ⑳ (VI 5V) (−) side: CN102 pin ⑲ (VI GND)
Measuring instrument	Digital voltmeter
Adjustment element	RV101
Specified value	4.90±0.02V_{DC}

[Adjustment Method]

1) Adjust to 4.90±0.02V_{DC} with RV101.

4-5. VIDEO ADJUSTMENT

The adjustment of the video system should in principle follow the adjustment procedure below. The color video input signal supplied from the pattern generator is used as the video input signal for video adjustment in the REC mode. Make sure that the SYNC signal and color burst signal are matched with the standard specified for set-up as shown in the Fig. 4-2 during adjustment.

[Adjustment Sequence]

1) Playback Frequency Characteristic Adjustment
2) X'tal Oscillator fo Check
3) E-E Adjustment
4) IR Adjustment
5) Chroma Comb Filter Adjustment
6) Emphasis Y Level Adjustment
7) L Mode Y FM Carrier Frequency, Y FM Deviation Adjustment
8) E Mode Y FM Carrier Frequency, Y FM Deviation Adjustment
9) Chroma Emphasis Adjustment
10) HUE Phase Deviation Adjustment
11) Recording current Adjustment
12) Y Level Adjustment
13) C Out Level Adjustment
14) PB CCD Input Level Adjustment
15) E Mode PB Y Level Adjustment
16) L Mode PB Y Level Adjustment
17) YD Adjustment

4-5-1. Playback Frequency Characteristic Adjustment (SS-133 Board)

(1) CH1, CH2 Adjustment

Description in [ ] is for CH2 adjustment.

Mode	Playback
Signal	Alignment tape for frequency characteristic adjustment (WR5-7CE)
Measurement point	CN200 pin ③ External trigger : CN200 pin ④ (RF SWP) Trigger scope : +, [−]
Measuring instrument	Oscilloscope
Adjustment element	RV202 [RV203]
Specified value	When the 4.5MHz signal level is set to 3, the 8.5 MHz signal level is 2±0.2.

[Adjustment Method]

1) Adjust RV202 [RV203] so that the 8.5MHz signal level will be 2±0.2 when the 4.5MHz signal level is set to 3.

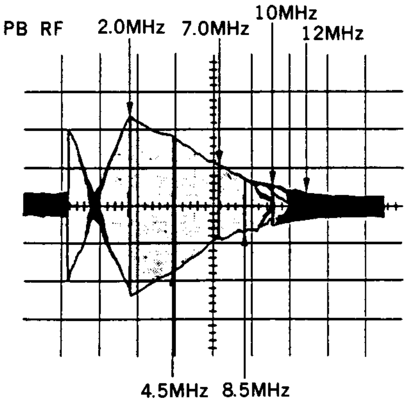


Fig. 4-9.

(2) CH1′ Adjustment

Mode	Playback (service mode)
Signal	Alignment tape for frequency characteristic adjustment (WR5-7CE)
Measurement point	CN200 pin ③ External trigger : CN200 pin ④ (RF SWP) Trigger slope : −
Measuring instrument	Oscilloscope
Adjustment element	RV201
Specified value	The 8.5MHz signal level is 2±0.2 when the 4.5 MHz signal level is set to 3.

[Adjustment Method]

1) Turn on the HOLD of the adjustment remote control.
2) Set the adjustment remote control page 1 and the adress 4D, and write down the data value. (This data is set to A.).
3) Adjust the data to 20 with the adjustment remote control.
4) Feed the address in order to store the adjustment data.
5) Turn off the HOLD of the adjustment remote control and set the playback mode.
6) Adjust with RV201 so that the 8.5MHz signal level in 2±0.2 when the 4.5MHz signal is set to 3.
7) After the adjustment, set the page 1 and the address 40, and set the data A.
8) Feed the address in order to store the adjustment data.

4-5-2. X'tal Oscillator fo Check (VA-62 Board)

Made	E-E
Signal	Color bar
Measurement point	IC651 pin ⑫
Measuring instrument	Oscilloscope Frequency counter
Specified value	4433619±50Hz

Note : Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

[Check Method]

1) Make sure that the oscillation frequency of IC651 pin ⑫ is 4433619±50Hz.

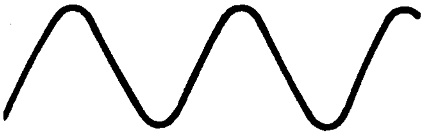


Fig. 4-10.

4-5-3. E-E Level Adjustment (VA-62 Board)

Mode	E-E
Signal	Color bar (VIDEO)
Measurement point	J651 (VIDEO OUT terminal)
Measuring instrument	Oscilloscope
Adjustment element	RV652
Specified value	1.000±0.025Vp-p

Note 1 : Set the POWER switch (FK-46 board S509) to be in the "CAMERA" mode and input the color bar signal by the component from the VA-62 board CN650. (Refer to Fig. 4-1 (b).)

Note 2 : J651 (VIDEO OUT terminal) mast be terminated at 75Ω.

[Adjustment Method]

1) Adjust to 1.000±0.025Vp-p with RV652.

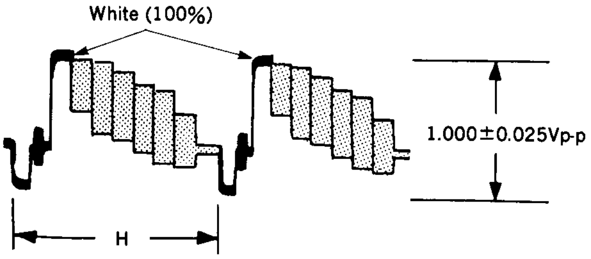


Fig. 4-11.

4-5-4. IR Adjustment (VA-62 Board)

Mode	Record
Signal	Color bar (VIDEO)
Measurement point	IC650 pin ⑦
Measuring instrument	Oscilloscope
Adjustment element	RV650
Specified value	Minimum red residual chroma component (50mVp-p or less)

[Adjustment Method]

1) Minimize the red residual chroma component with RV650.(50mVp-p or less)

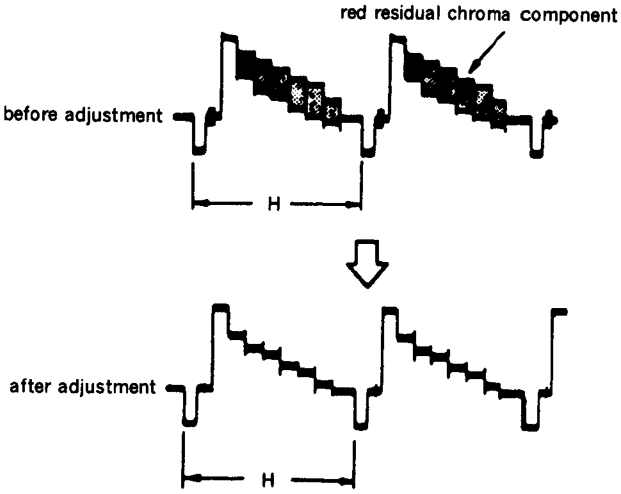


Fig. 4-12.

4-5-5. Chroma Comb Filter Adjustment (VA-62 Board)

Mode	Record
Signal	Color bar (S VIDEO)
Measurement point	IC650 pin ⑪
Measuring instrument	Oscilloscope
Adjustment element	RV651 (COMB) RV664 (SEP)
Specified value	Minimum red residual chroma component (30mVp-p or less)

[Adjustment Method]

1) Adjust RV651 and RV664 alternately and minimize the red residual chroma component. (30mVp-p or less)

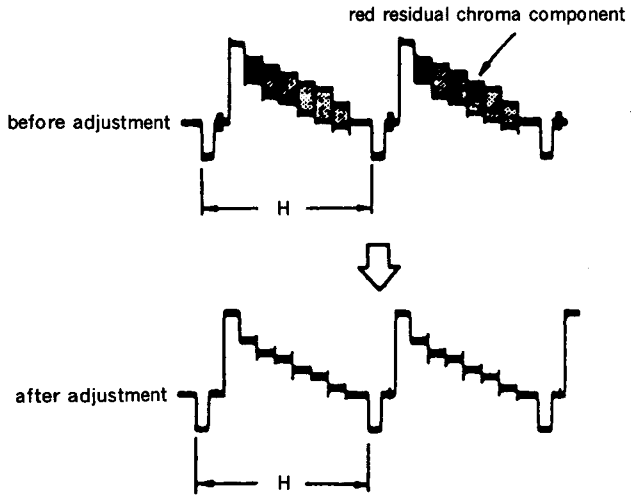

red residual chroma component
before adjustment
H
after adjustment
H

Fig. 4-13.

4-5-6. Emphasis Y Level Adjustment (VA-62 Board)

Mode	Record
Signal	Color bar
Measurement point	IC650 pin ③
Measuring instrument	Oscilloscope
Adjustment element	RV662
Specified value	500±20mVp-p

Note : Set the POWER switch (FK-46 board S509) to be in the "CAMERA" mode and input the color bar signal by the component from the VA-62 board CN650. (Refer to Fig. 4-1 (b).)

[Adjustment Method]

1) Adjust to 500±20mVp-p with RV662.

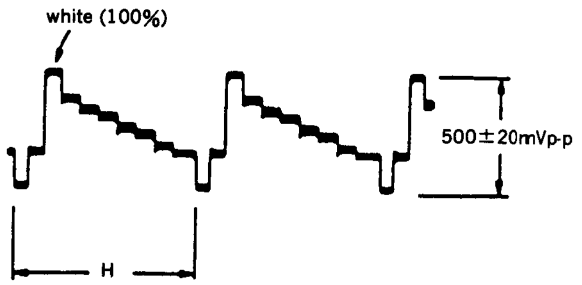

white (100%)
500±20mVp-p
H

Fig. 4-14.

4-5-7. L Mode Y FM Carrier Frequency, Y FM Deviation Adjustment

Note : After completing this adjustment, be sure to make E mode Y FM carrier frequency, Y FM deviation adjustment as described in 4-5-8.

(1) L Mode Y FM Carrier Frequency Adjustment (VA-62 Board)

Mode	E-E
Signal	No signal
Measurement point	IC650 pin ㊸ (Y RF OUT)
Measuring instrument	Frequency counter
Adjustment element	RV653
Specified value	4.20±0.05MHz

Note 1 : Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

Note 2 : Set the POWER switch (FK-46 board S509) to be in the "CAMERA" mode and input the color bar signal by the component from the VA-62 board CN650. (Refer to Fig. 4-1 (b).)

[Adjustment Method]

1) Set an MP type cassette tape.
2) Adjust to 4.20±0.05MHz with RV653.
3) Make L mode Y FM deviation adjustment described in (2) below.

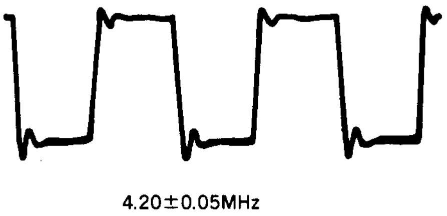


Fig. 4-15.

(2) L Mode Y FM Deviation Adjustment (VA-62 Board)

Mode	Recording and playback
Signal	Color bar (S VIDEO)
Measurement point	J650 (S VIDEO) Y signal terminal
Measuring instrument	Oscilloscope
Adjustment element	RV654
Specified value	Playback level of 1.00±0.05Vp-p

Note 1 :Y level out adjustment and L mode Y FM carrier frequency adjustment must have been completed.

Note 2 : Set the POWER switch (FK-46 board S509) to be in the "CAMERA" mode and input the color bar signal by the component from the VA-62 board CN650. (Refer to Fig. 4-1 (b).)

[Adjustment Method]

1) Set an MP type cassette tape.
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback output level.
   Specified value : 1.00±0.05Vp-p.
5) When the specified value is not met, turn RV654 as follows and repeat the steps 1) through 3) above.

	RV654 Rotating Direction
When larger than specified value	Counterclockwise direction (↺)
When smaller than specified value	Clockwise direction (↻)

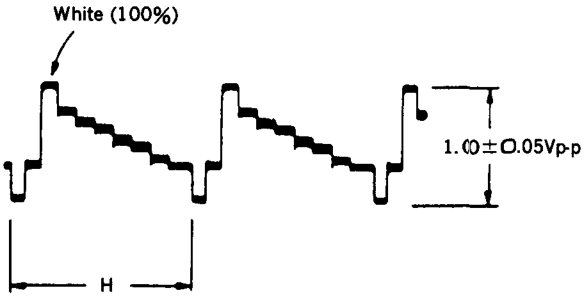


Fig. 4-16.

4-5-8. E Mode Y FM Carrier Frequency, Y FM Deviation Adjustment

Note 1 : Make this adjustment after completing "4-5-7 L Mode Y FM Carrier Frequency, Y FM Deviation Adjustment".

Note 2 : A connector must be inserted into the S VIDEO IN terminal (J651) (at no-signal time as well).

(1) E Mode Y FM Carrier Frequency Adjustment (VA-62 Board)

Mode	E-E
Signal	No signal
Measurement point	IC650 pin ㊸ (Y RF OUT)
Measuring instrument	Frequency counter
Adjustment element	RV656
Specified value	5.70±0.05MHz

Note 1 : Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

Note 2 : Set the POWER switch (FK-46 board S509) to be in the "CAMERA" mode and input the color bar signal by the component from the VA-62 board CN650. (Refer to Fig. 4-1 (b).)

[Adjustment method]

1) Set an ME type cassette tape.
2) Adjust to 5.70±0.05MHz with RV656.
3) Make E mode Y FM deviation adjustment as described in (2) below.

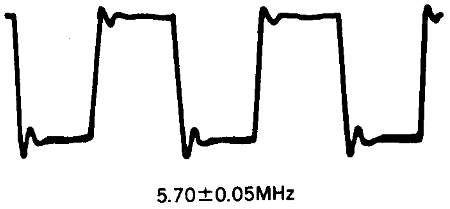


Fig. 4-17.

(2) E Mode Y FM Deviation Adjustment (VA-62 Board)

Mode	Recording and playback
Signal	Color bar (S VIDEO)
Measurement point	J650 (S VIDEO) Y signal terminal
Measuring instrument	Oscilloscope
Adjustment element	RV657
Specified value	Playback level of 1.00±0.05Vp-p

Note 1 : Y out level adjustment and E mode Y FM carrier frequency adjustment must have been completed.

Note 2 : Set the POWER switch (FK-46 board S509) to be in the "CAMERA" mode and input the color bar signal by the component from the VA-62 board CN650. (Refer to Fig. 4-1 (b).)

[Adjustment Method]

1) Set an ME type cassette tape.
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback output level.
   Specified value : 1.00±0.05Vp-p
5) When the specified value is not met, turn RV657 as follows and repeat the steps 1) through 3) above.

	RV657 Rotating Direction
When larger than specified value	Counterclockwise direction (↶)
When smaller than specified value	Clockwise direction (↷)

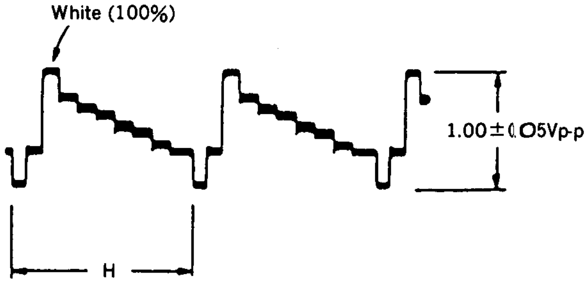


Fig. 4-18.

4-5-9. Chroma Emphasis Adjustment (VA-62 Board)

Mode	E-E
Signal	Color bar (S VIDEO)
Measurement point	IC651 pin ㉔
Measuring instrument	Oscilloscope
Adjustment element	FL650
Specified value	Minimum red level (170mVp-p or less)

Note : Set the POWER switch (FK-46 board S509) to be in the "CAMERA" mode and input the color bar signal by the component from the VA-62 board CN650. (Refer to Fig. 4-1 (b).)

[Adjustment Method]

1) Minimize the red level with FL650 (170mVp-p or less)

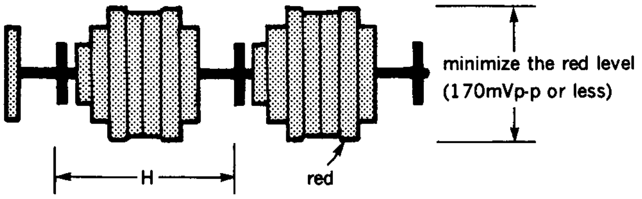


Fig. 4-19.

4-5-10. HUE Phase Deviation Adjustment (VA-62 Board) (Use a Vectorscope)

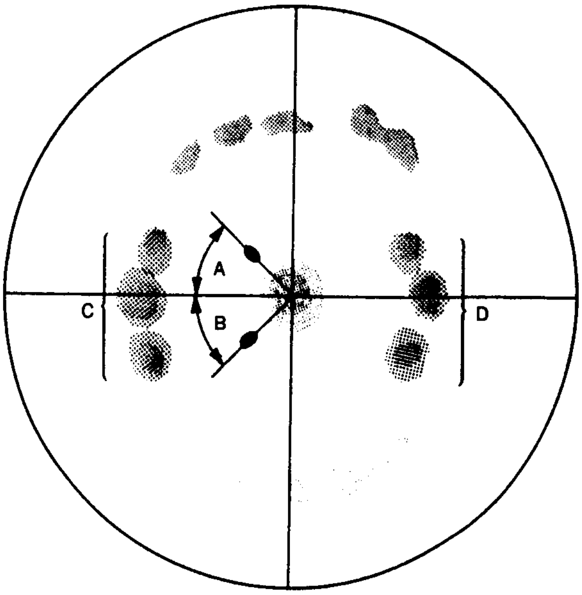
Mode	Playback+Pause
Signal	Alignment tape for operation check (WR5-5CSP), Color bar portion
Measurement point	J650 (VIDEO OUT)
Measurement equipment	Vectorscope
Adjustment element	RV686 (FSC) RV658 (APC LPE)
Specified value	See Fig. 4-20.

[Connection]

1) Input 4.43MHz signal from Pin⑫ of IC651 to 1CH of an oscilloscope.
2) Connect 1CH output of an oscilloscope to the EXT. subcarrier reference input of a vectorscope.
3) Put on the EXT. subcarrier switch of a vectorscope.

[Adjustment Method]

1) Adjust with RV686 so as to equalize A and B as shown in Fig. 4-20.
2) Adjust with RV658 so as to minimize the shaking of each three brighting point of C and D.



RV686: A=B
RV658: make C and D a contrast

Fig. 4-20.

4-5-11. Recording Current Adjustment

Make this adjustment in the E mode, using the ME tape. Before adjustment, check the following :

1) A connector must be inserted into the S VIDEO IN terminal (VA-62 board J650). (at no-signal time as well) Also, remove CN002 of the CC-33P board in order to prevent the index system from being affected.

(1) REC Y Recording Current Adjustment (SS-133 Board)

Mode	Recording
Signal	No signal
Measurement point	TP204
Measuring instrument	Oscilloscope
Adjustment element	RV207
Specified value	180±10mVp-p

Note 1 : After REC Y recording current adjustment, be sure to wake REC C, REC AFM and REC ATF recording current adjustments or check.

[Adjustment Method]

1) Set an ME type cassette tape and select the recording mode.
2) Adjust to 180±10mVp-p with RV207.

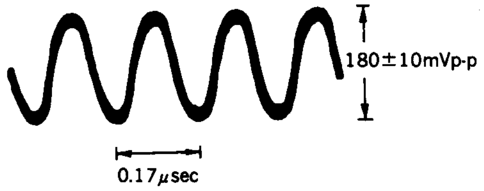


Fig. 5-21.

(2) REC C Recording Current Adjustment (SS-133 Board)

Mode	Recording
Signal	Color bar (S VIDEO)
Measurement point	TP204
Measuring instrument	Oscilloscope
Adjustment element	RV206
Specified value	45±5mVp-p

Note 1 : Set the POWER switch (FK-46 board S509) to be in the "CAMERA" mode and input the color bar signal by the component from the VA-62 board CN650. (Refer to Fig. 4-1 (b).)

[Connection]

1) Connect the following 3 sections with jumper wires.
   1. VA-62 board W650 pin ㉙ (REC Y RF) to pin ① (VIDEO 5V)
   2. VA-62 board W650 pin ㉞ (REC AFM RF) to pin ① (VIDEO 5V)
   3. SS-133 board Q153 emitter (ATF) to IC150 pin ㉗ (SS 5V)

[Adjustment Method]

1) Set an ME type cassette tape and select the recording mode.
2) Adjust to 45±5mVp-p with RV206.
3) After REC C recording current adjustment, be sure to make REC AFM and REC ATF recording current adjustments.

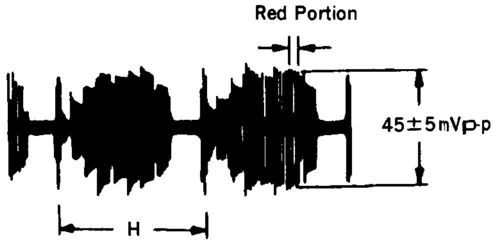


Fig. 4-22.

(3) REC AFM Recording Current Adjustment (SS-133 Board)

Mode	Recording
Signal	No signal
Measurement point	TP204
Measuring instrument	Oscilloscope
Adjustment element	RV205
Specified value	15.0±1.5mVp-p

Note 1 : When the TP204 signal level is too low to read, connect directly through a 100Ω resistor as shown in the figure below instead of using a probe of 10 : 1.

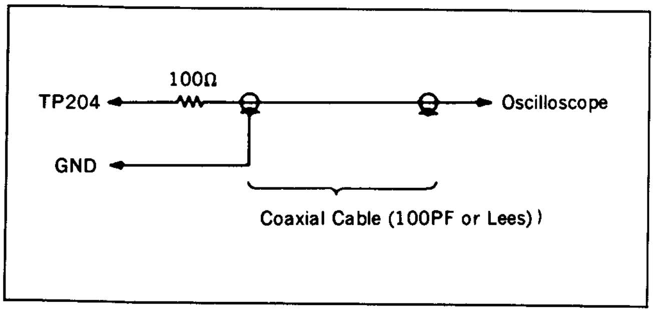


Fig. 4-23.

[Connection]

1) Connect the following 3 sections with jumper wires :
   1. VA-62 board W650 pin ㉙ (REC Y RF) to pin ① (VIDEO 5V)
   2. VA-62 board W650 pin ㉛ (REC C RF) to pin ① (VIDEO 5V)
   3. SS-133 board Q153 emitter (ATF) to IC150 pin ㉗ (SS 5V)

[Adjustment Method]

1) Set an ME type cassette tape and select the recording mode.
2) Adjust to 15.0±1.5mVp-p with RV205.

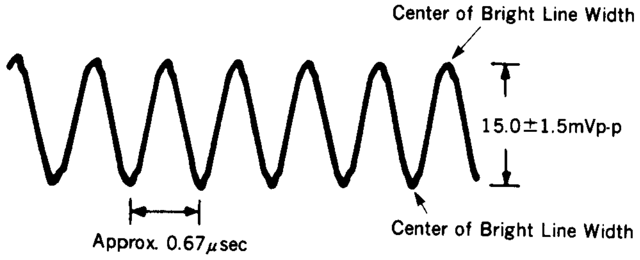


Fig. 4-24.

(4) REC ATM Recording Current Check (SS-133 Board)

Mode	Recording
Signal	No signal
Measurement point	TP204
Measuring instrument	Oscilloscope
Specified value	12.0±1.5mVp-p

Note 1 : When the TP204 signal level is too low to read, connect directly through a 100Ω resistor as shown in the figure below without using a probe of 10 : 1.

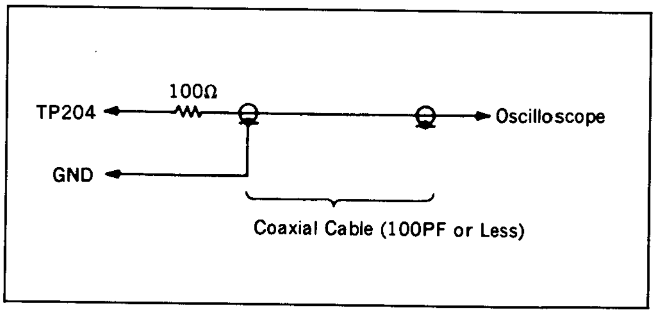


Fig. 4-25.

[Connection]

1) Connect the following 3 sections with jumper wires.
   1. VA-62 board W650 pin ㉙ (REC Y RF) to pin ① (VIDEO 5V)
   2. VA-62 board W650 pin ㉛ (REC C RF) to pin ① (VIDEO 5V)
   3. VA-62 board W650 pin ㉞ (REC AFM RF) to pin ① (VIDEO 5V)

[Adjustment Method]

1) Set an ME type cassette tape and select the recording mode.
2) Check to 12.0±1.5mVp-p.

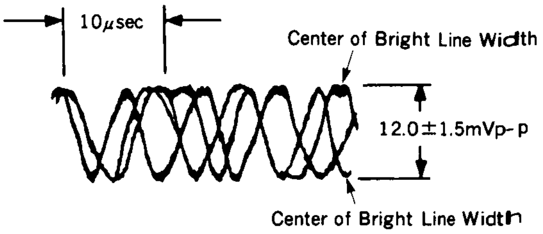


Fig. 4-26.

4-5-12. Y OUT Level Adjustment (VA-62 Board)

Mode	E-E
Signal	Color bar (S VIDEO)
Measurement point	J650 (S VIDEO) Y signal terminal
Measuring instrument	Oscilloscope
Adjustment element	RV661
Specified value	1.020±0.025Vp-p

Note: Set the POWER switch (FK-46 board S509) to be in the "CAMERA" mode and input the color bar signal by the component from the VA-62 board CN650. (Refer to Fig. 4-1 (b).)

[Connection]

1) Terminate the signal terminal for J650 (S VIDEO) at 75Ω.

[Adjustment Method]

1) Adjust to 1.020±0.025Vp-p with RV661.

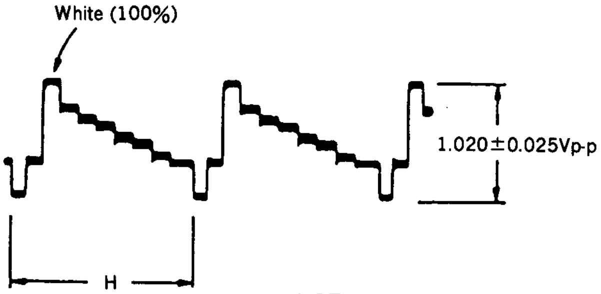


Fig. 4-27.

4-5-13. C OUT Level Adjustment (VA-62 Board)

Mode	E-E
Signal	Color bar (S VIDEO)
Measurement point	J650 (S VIDEO) chroma signal terminal
Measuring instrument	Oscilloscope
Adjustment element	RV666
Specified value	300±15mVp-p

Note: Set the POWER switch (FK-46 board S509) to be in the "CAMERA" mode and input the color bar signal by the component from the VA-62 board CN650. (Refer to Fig. 4-1 (b).)

[Connection]

1) Terminate the chroma signal terminal of J650 (S VIDEO) at 75Ω.

[Adjustment Method]

1) Adjust the burst level to 300±15mVp-p with RV666.

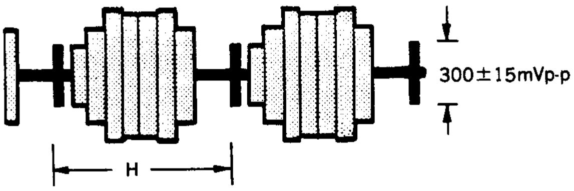


Fig. 4-28.

4-5-14. PB CCD Input Level Adjustment (VA-62 Board)

Mode	Playback
Signal	Alignment tape : Operation check (WR5-8CSE) color bar portion
Measurement point	IC650 pin ⑮
Measuring instrument	Oscilloscope
Adjustment element	RV655
Specified value	500±25mVp-p

[Adjustment Method]

1) Adjust to 500±25mVp-p with RV655.

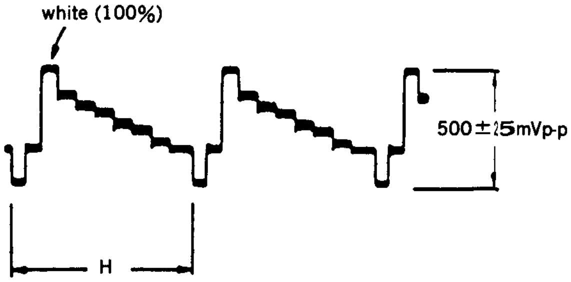


Fig. 4-29.

4-5-15. E Mode PB Y Level Adjustment (VA-62 Board)

Mode	Playback
Signal	Alignment tape for operation checking (WR5-8CSE) color bar portion
Measurement point	J650 (S VIDEO) Y signal terminal
Measuring instrument	Oscilloscope
Adjustment element	RV663
Specified value	1.020±0.025Vp-p

[Adjustment Method]

1) Adjust to 1.020±0.025Vp-p with RV663.

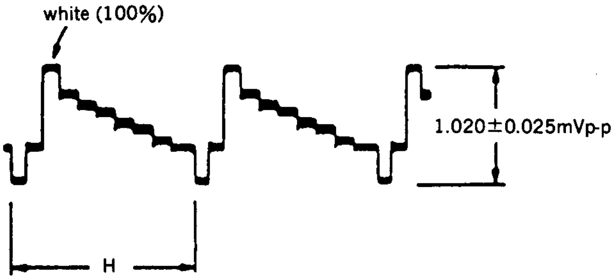


Fig. 4-30.

4-5-16. L Mode PB Y Level Adjustment (VA-62 Board)

Mode	Playback
Signal	Alignment tape for operation checking (WR5-5CSP or WR5-4CSP) color bar portion
Measurement point	J650 (VIDEO)
Measuring instrument	Oscilloscope
Adjustment element	RV417
Specified value	1.000±0.025Vp-p

Note 1 : Make this adjustment after completing E Mode PB Y Level Adjustment mentioned in 4-5-15.

[Adjustment Method]

1) Adjust to 1.000±0.025Vp-p with RV417.

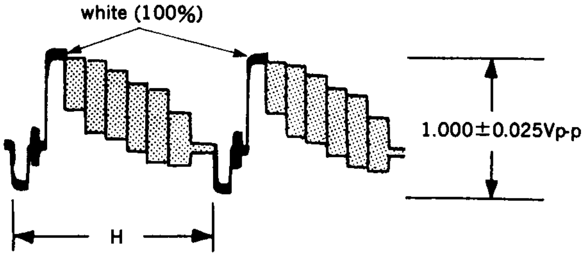


Fig. 4-31.

4-5-17. YD Adjustment (VA-62 Board)

Mode	Playback (PAUSE)
Signal	Alignment tape for operation checking color bar portion
Measurement point	Monitor TV display
Measuring instrument	Monitor TV display
Adjustment element	RV416
Specified value	Flickering is not significantly visible.

[Adjustment Method]

1) Playback the signal.
2) Adjust RV416 so that flickering is not significantly visible on the PAUSE screen.

4-6. Digital Titler System Adjustment

[Adjustment Spequence]

1) Charactor Generator fo Adjustment
2) DDS Charactor Position Adjustment
3) AFC Adjustment
4) 4FSC Frequency Adjustment
5) Controler Frequency Adjustment
6) Tracking TH Adjustment

4-6-1. Character Generator fo Adjustment (SS-133 Board)

Mode	REC
Signal	Non-signal
Measurement point	IC102 pin ⑲
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	CT102
Specified value	15678±50Hz

Note : Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

[Adjustment Method]

1) Adjust to 15678±50Hz with CT102.

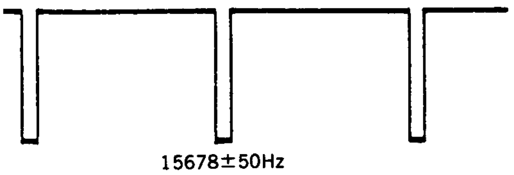


Fig. 4-32.

4-6-2. DDS Character Position Adjustment (SS-133 Board)

Mode	Playback (Data screen ON)
Signal	Color bar (used signal of TG-7)
Measurement point	Monitor TV display
Measuring instrument	Monitor TV
Adjustment element	CT101
Specified value	The inner line to the dividing line between red and blue.

[Adjustment Method]

1) Turn on the DATA SCREEN switch (FK-46 board S512).
2) Adjust the last inner line to the dividing line between red and blue with CT101. (Refer to Fig. 4-33)
3) Turn off the DATA SCREEN switch (FK-46 board S512).

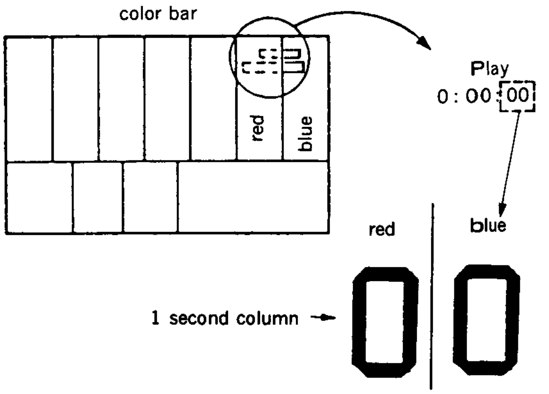


Fig. 4-33.

4-6-3. AFC Adjustment (SS-133 Board)

Mode	E-E
Signal	Monoscope
Measurement point	C122 ⊖ side
Measuring instrument	Digital voltmeter or Oscilloscope (DC lenge)
Adjustment element	RV100
Specified value	$2.6\pm0.1V_{dc}$

[Adjustment Method]

1) Adjust to $2.6\pm0.1V_{dc}$ with RV100.

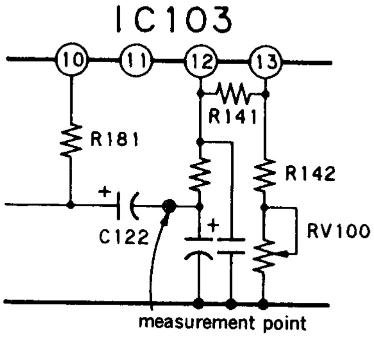


Fig. 4-34.

4-6-4. 4FSC Frequency Adjustment (FD-15P Board)

Mode	E-E
Signal	Non-signal
Measurement point	Q314 Emitter
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	CT302
Specified value	4433619±50Hz

Note : Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

[Adjustment Method]

1) Adjust to 4433619±50Hz with CT302.

4-6-5. Controller Frequency Adjustment (FD-15P Board)

Mode	E-E
Signal	Non-signal
Measurement point	IC301 pin ⑪
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	CT301
Specified value	9437±50kHz

Note : Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

[Adjustment Method]

1) Adjust to 9437±50kHz with CT301.

4-6-6. Tracking TH Adjustment (FD-15P Board)

Mode	E-E
Signal	Staircase (8 stairs)
Measurement point	CH 1 : CN201 pin ⑰ (Staircase input) CH 2 : IC303 pin ① (A/D select output)
Measuring instrument	Oscilloscope
Adjustment element	RV302
Specified value	Staircases to the second stair should be fetched and the third one should not be fetched.

[Adjustment Method]

1) Adjust to satisfy the specified value with RV302. (Refer to Fig. 4-35.

Note : In the case that ten staircases are used. the second stair should be fetched and the fourth one should not be fetched.

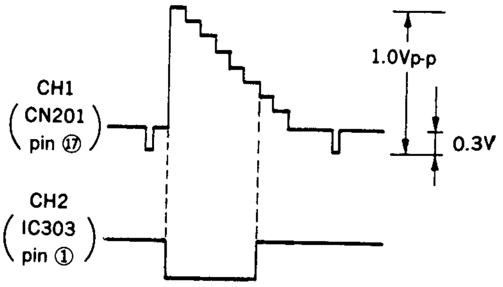


Fig. 4-35.

4-7. INDEX SYSTEM ADJUSTMENT

4-7-1. PB VCO Free Oscillation Frequency Adjustment (CC-33P Board)

Mode	Playback
Signal	Arbitrary tape
Measurement point	IC911 pin ⑧
Measuring instrument	Frequency counter
Adjustment element	RV910
Specified value	11.50±0.05MHz

Note: Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

[Connection]

1) Connect the IC911 pin ① (DUTY) and IC911 pin ⑥ (DVCC) with a jumper wire.
2) Connect the IC911 pin ⑳ (PB RF) and IC911 pin ⑨ (D GND) with jumper wire.

[Adjustment Method]

1) Adjust to 11.50±0.05MHz with RV910.
2) After adjustment, remove jumper wires.

4-8. AUDIO SYSTEM ADJUSTMENT

- Perform adjustment with the color bar signal used as the video input signal.

Connect the audio system measuring instrument as shown in the following figure as well as the video system measuring instrument, and perform the adjustment at the 「Video」 position of the power switch.

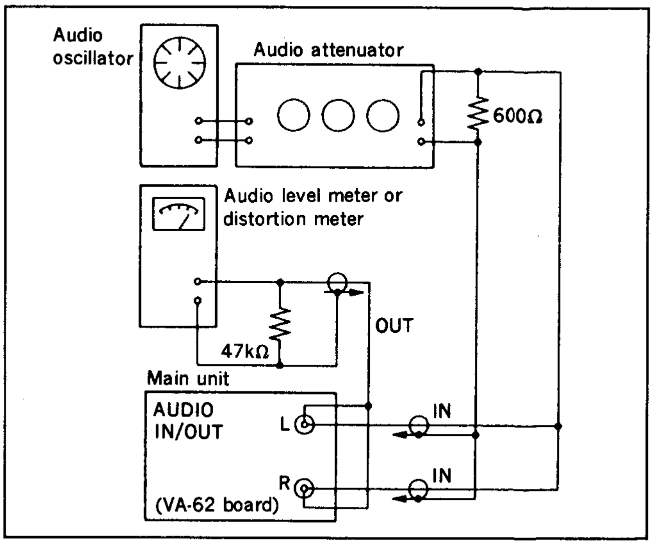


Fig. 4-36.

[Adjustment Spequence]

1) Recording Matrix Adjustment
2) AFM Carrier Frequency Check
3) IR Adjustment
4) Deviation Adjustment
5) Playback Matrix Adjustment
6) Recording AFM Carrier Level Adjustment
7) Playback Level Adjustment
8) Overall Output Level Check
9) Overall Frequency Characteristics Check
10) Overall Distortion Check
11) Overall Noise Level Check

4-8-1. Recording Matrix Adjustment (AU-60P Board)

Mode	Recording
Signal	400Hz, −7.5dBs both L and R
Measurement point	IC401 pin ③
Measuring instrument	Audio level meter
Adjustment element	RV401
Specified value	Less than 5mVp-p

[Adjustment Method]

1) Adjust to less than 5mVp-p with RV401.

4-8-2. AFM Carrier Frequency Check (AU-60P Board)

Mode	Recording
Signal	No-signal
Measurement point	L : IC403 pin ⑧ R : IC404 pin ⑧
Measuring instrument	Frequency counter
Specified value	L : 1.50±0.02MHz R : 1.70±0.02MHz

Note : Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

[Checking Method]

1) Turn off the output of the audio oscillator.
2) Check that the AFM carrier frequency in L : 1.50±0.01MHz and R : 1.70±0.02MHz.

4-8-3. IR Adjustment (AU-60P Board)

Mode	Self-recording and playback
Signal	Record no signal by inserting shorting plugs into andio input jacks (both L and R). Playback the recorded section.
Measurement point	L : IC403 pin ㊹ — IC403 pin ⑥ R : IC404 pin ㊹ — IC404 pin ⑥
Measuring instrument	Digital voltmeter
Adjustment element	L : RV405 R : RV407
Specified value	Less than ±10mV

[Adjustment Method]

1) Adjust alternately the RV405 and the RV407 to be below ±10mV.

4-8-4. Deviation Adjustment (AU-60P Board)

Mode	Playback
Signal	Alignment tape for AFM stereo checking operation (WR5-5CSP). Monoscope portion.
Measurement point	L : IC403 pin ㉔ R : IC404 pin ㉔
Measuring instrument	Level meter
Adjustment element	L : RV404 R : RV408
Specified value	−15.0±0.2dBs

[Adjustment Method]

1) Adjust alternately the RV404 and the RV408 to be −15.0±0.2dBs.

4-8-5. Playback Matrix Adjustment (AU-60P Board)

Mode	Self-recording and playback
Signal	Record 400Hz/−7.5dBs signal by connecting audio oscillator to R-channel audio input jack. Insert a shorting plug into L-channel audio input. Playback the recorded section.
Measurement point	L-channel audio output jack
Measuring instrument	Level meter
Adjustment element	RV402
Specified value	Less than −40dBs

[Adjustment Method]

1) Adjust to be below −40dBs with the RV402.

4-8-6. Recording AFM Carrier Level Adjustment (AU-60P Board)

Mode	Recording
Signal	No signal Insert a short plug into L-channel audio input jack only. Don't insert any play into R-channel.
Measurement point	W401 pin ⑭ (REC AFM RF)
Measuring instrument	Oscilloscope
Adjustment element	RV403 RV406
Specified value	80±5mV

[Adjustment Method]

1) Adjust alternately the RV403 and the RV406 to be 80±5mV.

4-8-7. Playback Level Check

Mode	Playback
Signal	Alignment tape: Operation checking (WR5-5CSP)
Measurement point	Audio output L 〔R〕 terminal
Measuring instrument	Audio level meter
Specified value	−7.5±2dBs

[Checking Method]

1) Confirm that the audio output level is −7.5±2dBs.

4-8-8. Overall Output Level Check

Mode	Self-recoading and playback
Signal	400Hz, −7.5dBs
Measurement point	Audio output L 〔R〕 terminal
Measuring instrument	Audio level meter
Specified value	−7.5±3dBs

[Checking Method]

1) Recoad the signal.
2) Playback the recoding section.
3) Make sure that the audio output level is −7.5±3dBs.

4-8-9. Overall Frequency Characteristics Check

Mode	Self-recording and playback
Signal	Ⓐ 400Hz, −17.5dBs Ⓑ 30Hz, −17.5dBs Ⓒ 10Hz, −17.5dBs
Measurement point	Audio output L 〔R〕 termial
Measuring instrument	Audio level meter
Specified value	With the 400Hz playback output level as 0dB, the playback output level of 30Hz and 10kHz is 0±3dB

[Checking Method]

1) Record signal Ⓐ through Ⓒ in order.
2) Playback the recorded sections.
3) With the 400Hz playback output level as 0dB, confirm that the playback output level of 30Hz and 10kHz is 0±3dB.

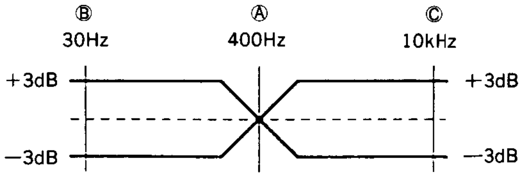


Fig. 4-37.

4-8-10. Overall Distortion Check

Mode	Self recording and playback
Signal	400Hz, −7.5dBs
Measurement point	Audio output L 〔R〕 terminal
Measuring instrument	Distorsion meter
Specified value	Less than 0.8%[*1]

[Checking Method]

1) Record the signal.
2) Playback the recorded section.
3) Confirm that the distortion is less than 0.8%.[*1]

[*1] Value when 200Hz to 3kHz BPF is used.

4-8-11. Overall Noise Level Check

Mode	Self-recording and playback
Signal	No signal (Shorting plug is inserted into audio input jack)
Measurement point	Audio L 〔R〕 input terminal
Measuring instrument	Audio level meter
Specified value	Less than −61.5dBs*[2]

[Checking Method]

1) Record the signal
2) Playback the recorded section
3) Make sure that the noise level is less than −61.5dBs.*[2]

*[2] Value when IHF-A hearing correction filter is used.

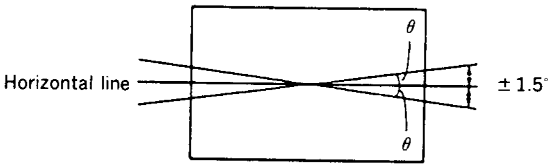
4-9. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (TYPE A) (VF-27 BOARD)

4-9-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified value	See Fig. 4-39

[Adjustment Method]

1) By turning RV904 (BRIGHT), adjust for a luminance level which provides appropriate visibility of the CRT screen.
2) Loosen the DY (deflection yoke) tightening nut.
3) Make the image horizontal by rotating DY.
4) Retighten the DY tightening nut. (Do not tighten excessively.)


θ
Horizontal line
±1.5°
θ

Specified value : Image orientation within±1.5° of horizontal line.

Fig. 4-39.

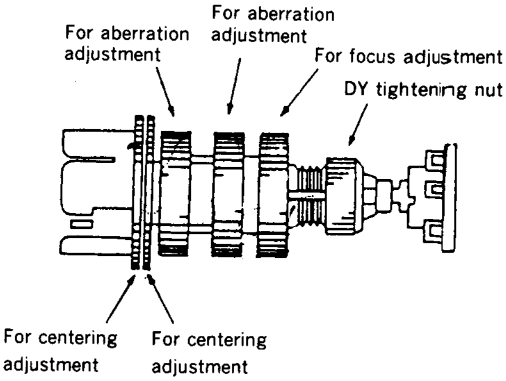

For aberration adjustment
For aberration adjustment
For focus adjustment
DY tightening nut
For centering adjustment
For centering adjustment

Fig. 4-40.

4-9-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified value	See Fig. 4-41.

[Adjustment Method]

1) Turn the centering adjustment rings to provide an image with even night, left, upper and lower margins. (See Fig. 4-40.)

Note : Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

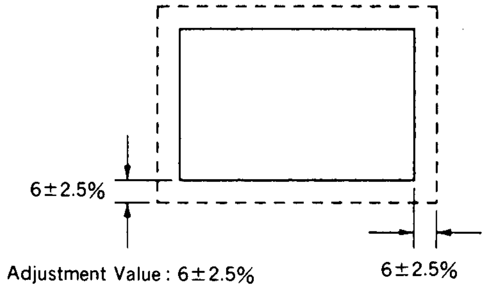


Fig. 4-41.

4-9-3. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion

[Adjustment Method]

1) Adjust for optimum focus using the focus ring. (See Fig. 4-40.)

4-9-4. Aberration Adjustment

Mode	E-E
Signal	Dot pattern
Specified value	See Fig. 4-42.

[Adjustment Method]

1) Use the aberration adjustment rings to adjust any trailing dots to within 2 times the dot diameter and any fan shaped aberrations to within the dot diameter.
2) If off center, repeat the Centering Adjustment.

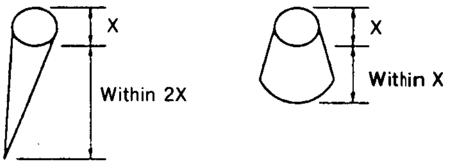


Fig. 4-42.

4-9-5. Horizontal Oscillation Frequency Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP)
Measurement point	CN904 pin ⑤
Measuring instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment element	RV901
Specified value	$2.60 \pm 0.05V_{DC}$

[Adjustment Method]

1) Adjust to $2.60 \pm 0.05V_{DC}$ using RV901.

4-9-6. Horizontal Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for cheking operation (WR5-5CSP) Monoscope portion
Adjustment element	C911
Specified value	6.0±3.0%

[Adjustment Method]

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating RV902.
2) Rotate RV904 to set the brightness to the normal level.
3) Short or open the pattern (A) of the H size adjustment capacitor (C911) to provide horizontal overscans of 6.0±3.0% (total of left and right).
(See Fig. 4-44.)

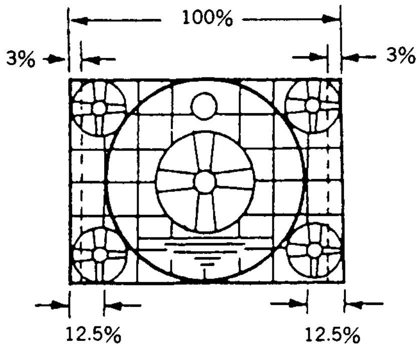
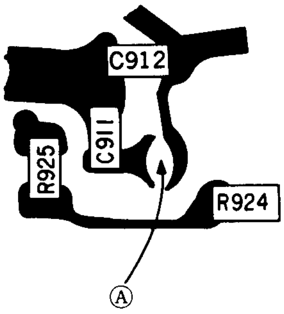


Fig. 4-43.



VF-27 Board
(conductor side)

A section	H size
Open	Large
Short	Small

Fig. 4-44.

4-9-7. Vertical Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	RV902
Specified value	6.0±3.0%

[Adjustment Method]

1) By turning RV902, adjust vertical overscan to 6.0±3.0% (upper and lower total).

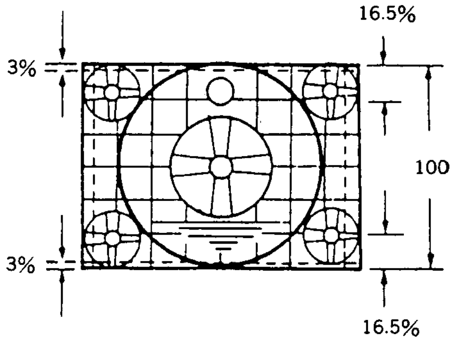


Fig. 4-45.

4-9-8. Brightness, Contrast Adjustments

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	Brightness : RV904 Contrast : RV903

[Adjustment Method]

1) Perform brightness and contrast adjustments alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

4-9-9. Horizontal Amplitude, Vertical Amplitude and Focus Checks

Values should conform to specifications given in 4-9-6. Horizontal Amplitude Adjustment and 4-9-7. Vertical Amplitude Adjustment. If not. readjust accordingly, and repeat 4-9-8. Brightness, Contrast Adjustments. In this case, focus needs to be checked. If the image is not clear, perform 4-9-3. Focus Adjustment and 4-9-4. Aberration Adjustment.

4-10. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (TYPE B) (VF-26 BOARD)

4-10-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified value	See Fig. 4-47.

[Adjustment Method]

1) Adjust the volume array Ⓓ (BRIGHT) for appropriate brightness on CRT screen. (See Fig. 4-48.)
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 4-46.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

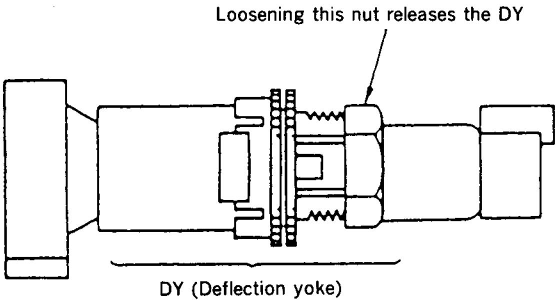
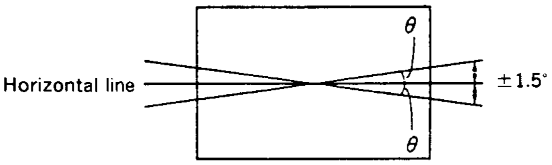

Loosening this nut releases the DY
DY (Deflection yoke)

Fig. 4-46.


θ
Horizontal line
±1.5°
θ

Specified value: Image orientation within±1.5° of horizontal line.

Fig. 4-47.

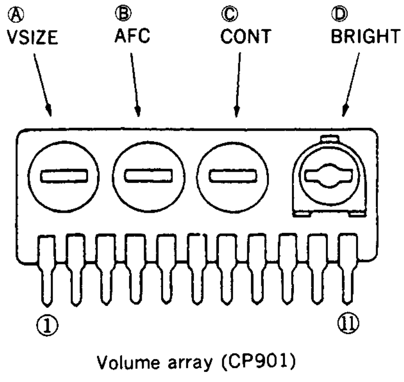

Ⓐ VSIZE
Ⓑ AFC
Ⓒ CONT
Ⓓ BRIGHT
①
⑪
Volume array (CP901)

Fig. 4-48.

4-10-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified value	See Fig. 4-50.

[Adjustment Method]

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 4-49.)

Note : Since the cenering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

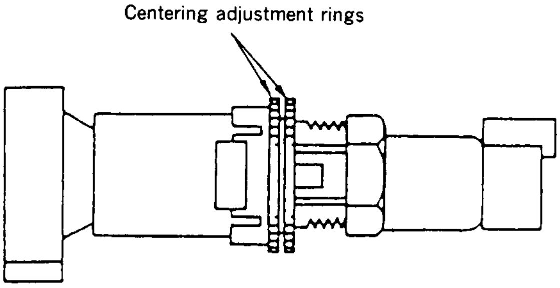

Centering adjustment rings

Fig. 4-49.

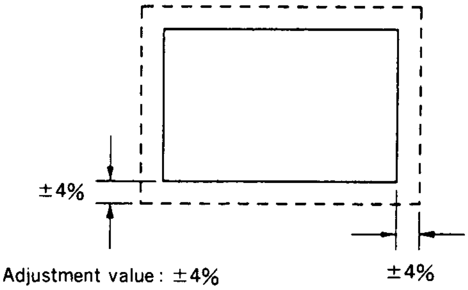

±4%
Adjustment value: ±4%
±4%

Fig. 4-50.

4-10-3. AFC Adjustment

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C915 ⊕ side
Measuring instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment element	Volume array Ⓑ (AFC)
Specified value	2.6±0.1V_{DC}

[Adjustment Method]

1) Adjust volume array Ⓑ (AFC) for 2.6±0.1V_{DC}. (See Fig. 4-48.)

4-10-4. Horizontal Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	C905
Specified value	6.0±3.0%

[Adjustment Method]

1) Line up the upper and lower section of monoscope image with the upper and lower edges of the screen by rotating volume array Ⓐ (V SIZE). (See Fig. 4-48.)
2) Rotate volume array Ⓓ (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern $\boxed{A}$ of the H size adjustment capacitor (C905) to provide horizontal overscans of 6.0± 3.0% (total of left and right). (See Fig. 4-52.)

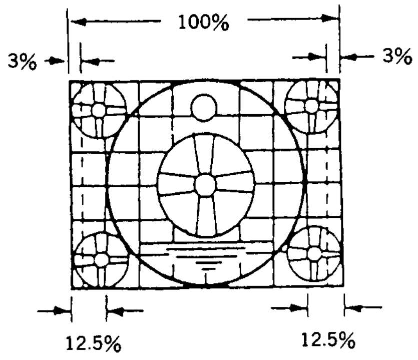
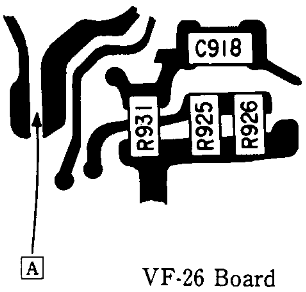


Fig. 4-51.



VF-26 Board
(conductor side)

A section	H size
Open	Large
Short	Small

Fig. 4-52.

4-10-5. Vertical Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	Volume array Ⓐ (V SIZE)
Specified value	6.0±3.0%

[Adjustment Method]

1) By turning volume array Ⓐ (V SIZE), adjust vertical overscan to 6.0±3.0% (upper and lower total). (See Fig. 5-53.)

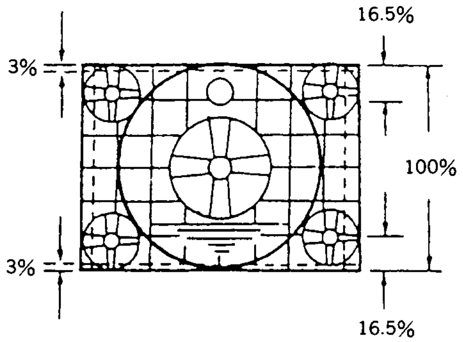

16.5%
3%
100%
3%
16.5%

Fig. 4-53.

4-10-6. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	RV901

[Adjustment Method]

1) Adjust to the best focus point with RV901.

4-10-7. Brightness, Contrast Adjustments

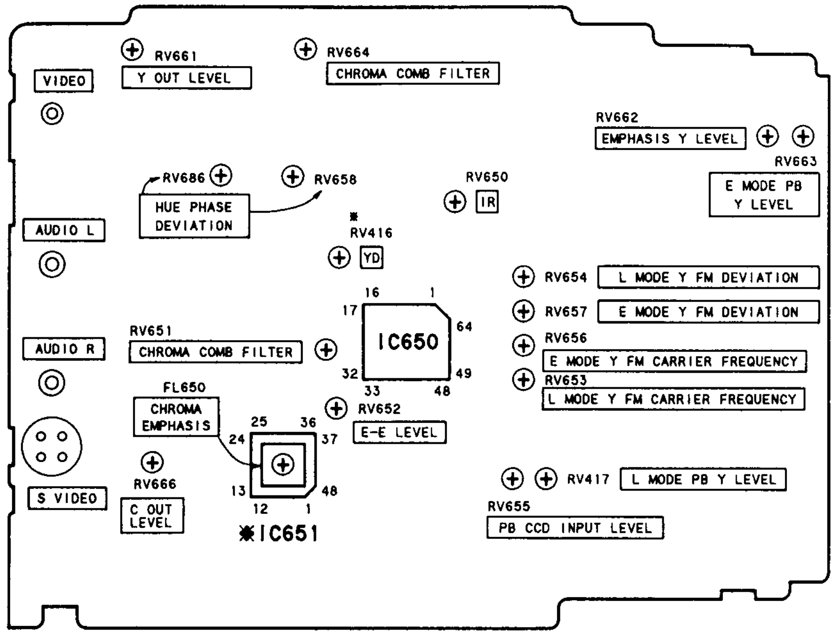
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment element	Brightness : Volume array Ⓓ (BRIGHT) Contrast : Volume array Ⓒ (CONT)

[Adjustment Method]

1) Adjust volume array Ⓓ (BRIGHT) and Ⓒ (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest areas is possible.)
(See Fig. 4-48.)

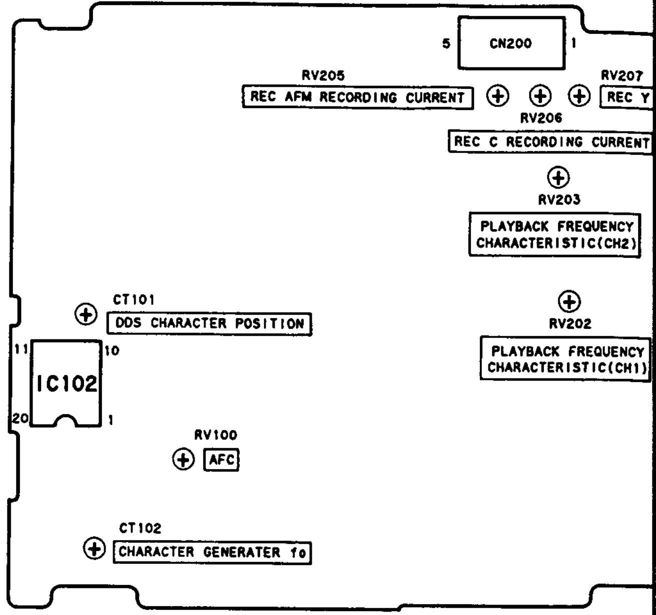
4-11. ADJUSTING PART LOCATION DIAGRAM

VA-62 BOARD (COMPONENT SIDE)

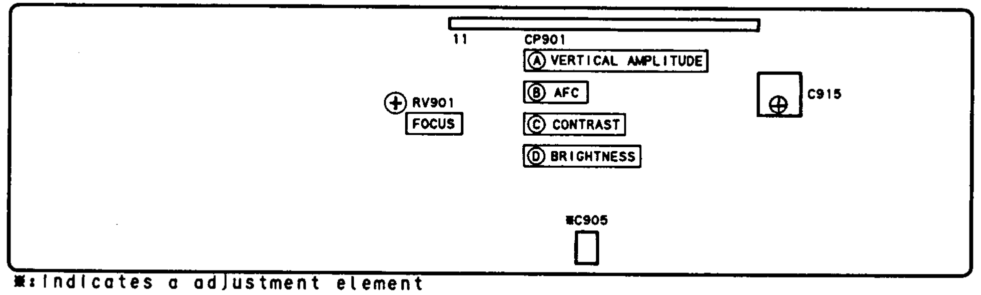

RV661
Y OUT LEVEL
RV664
CHROMA COMB FILTER
VIDEO
RV662
EMPHASIS Y LEVEL
RV663
E MODE PB Y LEVEL
RV686
HUE PHASE DEVIATION
RV658
RV650
IR
AUDIO L
*RV416
YD
RV654
L MODE Y FM DEVIATION
RV657
E MODE Y FM DEVIATION
16
1
17
64
IC650
32
49
33
48
RV651
CHROMA COMB FILTER
AUDIO R
RV656
E MODE Y FM CARRIER FREQUENCY
RV653
L MODE Y FM CARRIER FREQUENCY
FL650
CHROMA EMPHASIS
25
36
24
37
RV652
E-E LEVEL
13
48
12
1
*IC651
RV666
C OUT LEVEL
S VIDEO
RV417
L MODE PB Y LEVEL
RV655
PB CCD INPUT LEVEL

*: Indicates a adjustment element mounted on the conductor side.

SS-133 BOARD (COMPONENT SIDE)

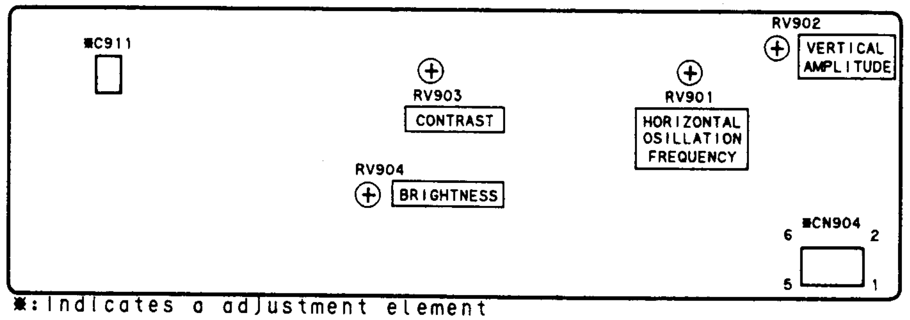

5
CN200
1
RV205
REC AFM RECORDING CURRENT
RV207
REC Y
RV206
REC C RECORDING CURRENT
RV203
PLAYBACK FREQUENCY CHARACTERISTIC(CH2)
CT101
DDS CHARACTER POSITION
RV202
PLAYBACK FREQUENCY CHARACTERISTIC(CH1)
11
10
IC102
20
1
RV100
AFC
CT102
CHARACTER GENERATER fo

VF-26 BOARD (COMPONENT SIDE)


11
CP901
Ⓐ VERTICAL AMPLITUDE
Ⓑ AFC
Ⓒ CONTRAST
Ⓓ BRIGHTNESS
RV901
FOCUS
C915
*C905

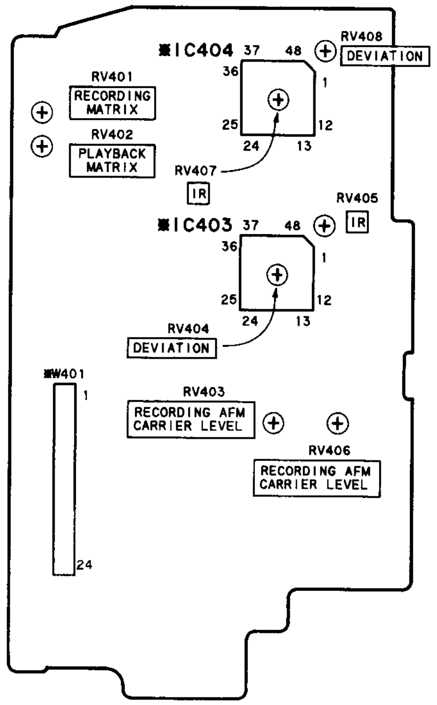
*: Indicates a adjustment element mounted on the conductor side.

VF-27 BOARD (COMPONENT SIDE)


*C911
RV903
CONTRAST
RV904
BRIGHTNESS
RV901
HORIZONTAL OSILLATION FREQUENCY
RV902
VERTICAL AMPLITUDE
*CN904
6
2
5
1

*: Indicates a adjustment element mounted on the conductor side.

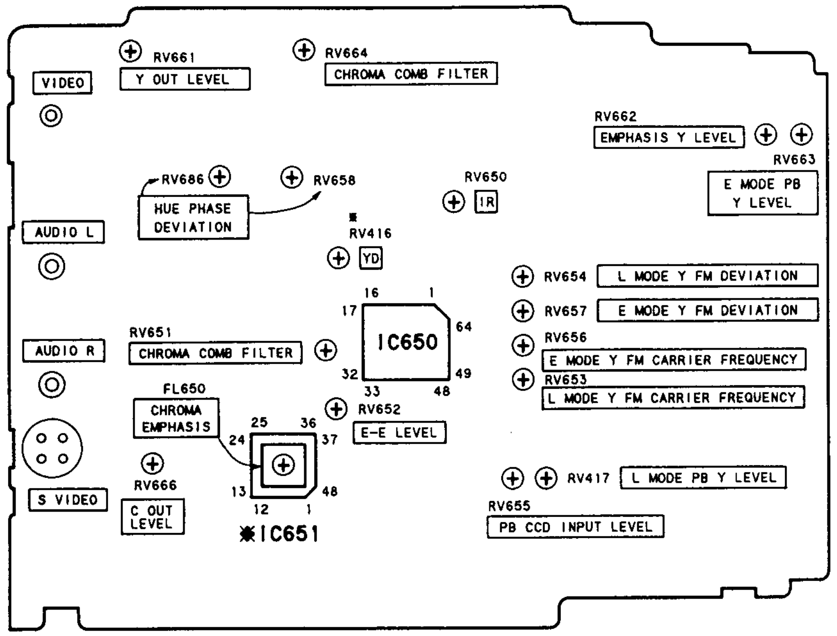
AU-60P BOARD (COMPONENT SIDE)


*IC404
37
48
RV408
DEVIATION
36
1
25
12
24
13
RV401
RECORDING MATRIX
RV402
PLAYBACK MATRIX
RV407
IR
*IC403
37
48
RV405
IR
36
1
25
12
24
13
RV404
DEVIATION
*W401
1
24
RV403
RECORDING AFM CARRIER LEVEL
RV406
RECORDING AFM CARRIER LEVEL

*: Indicates a adjustment element mounted on the conductor side.

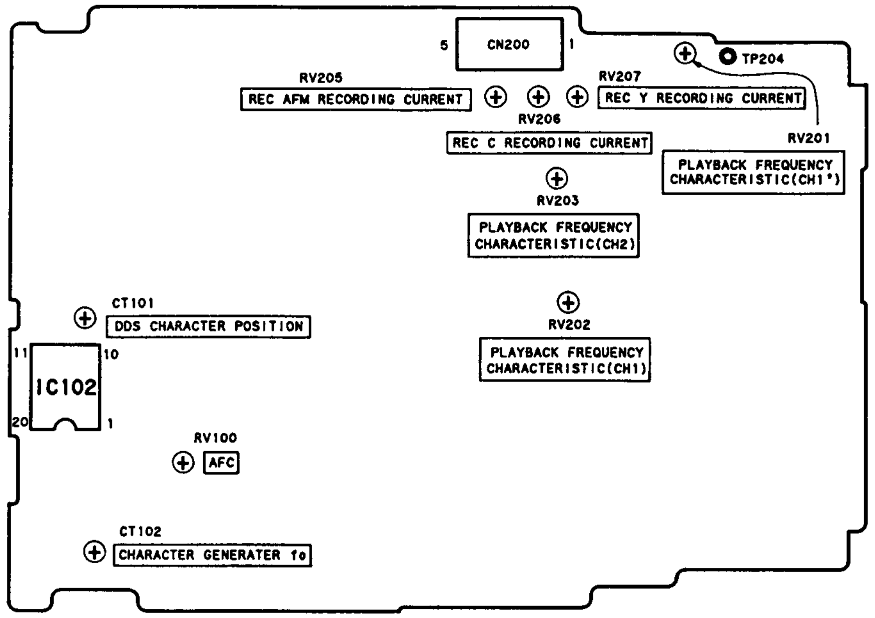
4-11. ADJUSTING PART LOCATION DIAGRAM

VA-62 BOARD (COMPONENT SIDE)

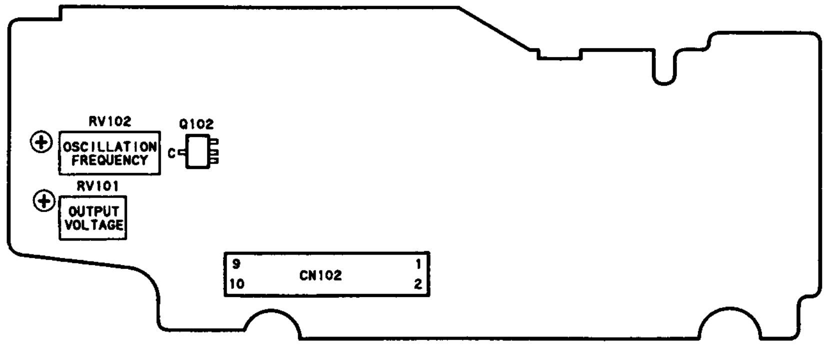

VIDEO
RV661
Y OUT LEVEL
RV664
CHROMA COMB FILTER
RV662
EMPHASIS Y LEVEL
RV663
E MODE PB Y LEVEL
RV686
HUE PHASE DEVIATION
RV658
RV650
IR
*RV416
YD
AUDIO L
RV654
L MODE Y FM DEVIATION
RV657
E MODE Y FM DEVIATION
RV656
E MODE Y FM CARRIER FREQUENCY
RV653
L MODE Y FM CARRIER FREQUENCY
16
1
17
IC650
64
32
49
33
48
AUDIO R
RV651
CHROMA COMB FILTER
FL650
CHROMA EMPHASIS
25
36
24
37
13
48
12
1
*IC651
RV652
E-E LEVEL
S VIDEO
RV666
C OUT LEVEL
RV417
L MODE PB Y LEVEL
RV655
PB CCD INPUT LEVEL

*: Indicates a adjustment element mounted on the conductor side.

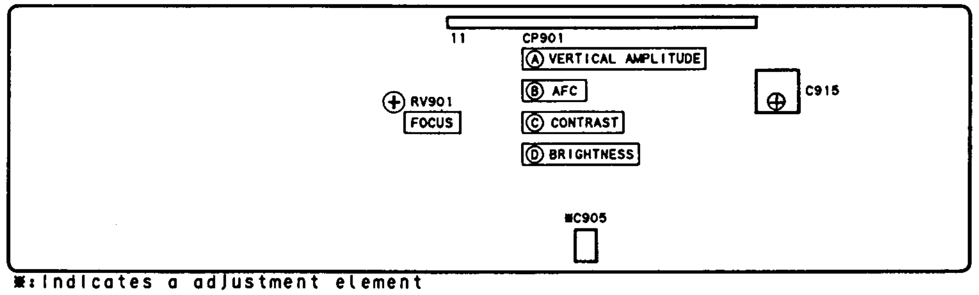
SS-133 BOARD (COMPONENT SIDE)


5
CN200
1
TP204
RV205
REC AFM RECORDING CURRENT
RV207
REC Y RECORDING CURRENT
RV206
REC C RECORDING CURRENT
RV201
PLAYBACK FREQUENCY CHARACTERISTIC(CH1')
RV203
PLAYBACK FREQUENCY CHARACTERISTIC(CH2)
CT101
DDS CHARACTER POSITION
11
IC102
10
20
1
RV202
PLAYBACK FREQUENCY CHARACTERISTIC(CH1)
RV100
AFC
CT102
CHARACTER GENERATER fo

FU-71P BOARD (COMPONENT SIDE)

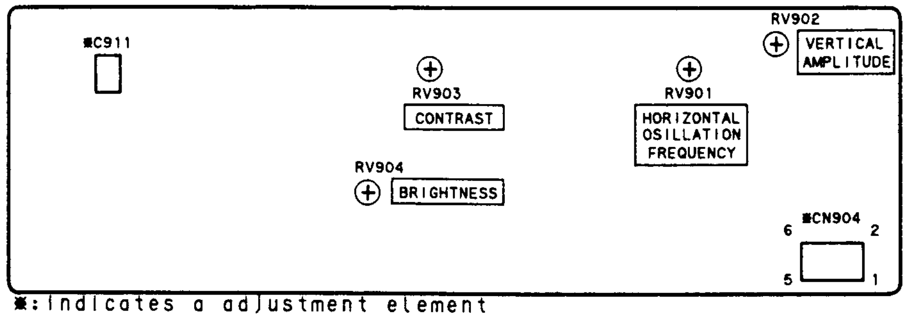

RV102
OSCILLATION FREQUENCY
Q102
C
RV101
OUTPUT VOLTAGE
9
10
CN102
1
2

VF-26 BOARD (COMPONENT SIDE)


11
CP901
Ⓐ VERTICAL AMPLITUDE
Ⓑ AFC
Ⓒ CONTRAST
Ⓓ BRIGHTNESS
RV901
FOCUS
C915
*C905

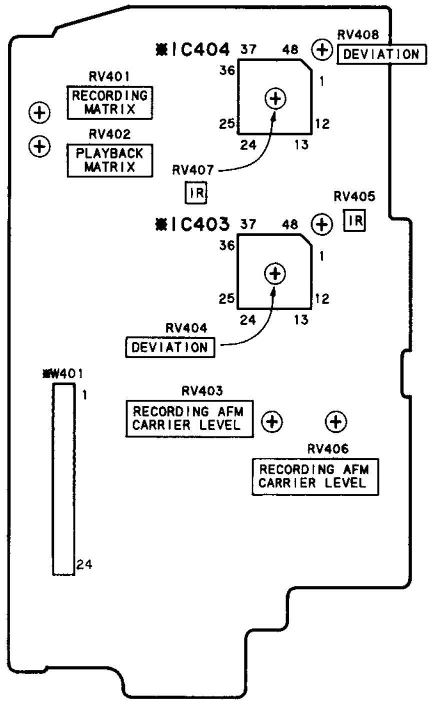
*: Indicates a adjustment element mounted on the conductor side.

VF-27 BOARD (COMPONENT SIDE)


*C911
RV902
VERTICAL AMPLITUDE
RV903
CONTRAST
RV901
HORIZONTAL OSILLATION FREQUENCY
RV904
BRIGHTNESS
*CN904
6
2
5
1

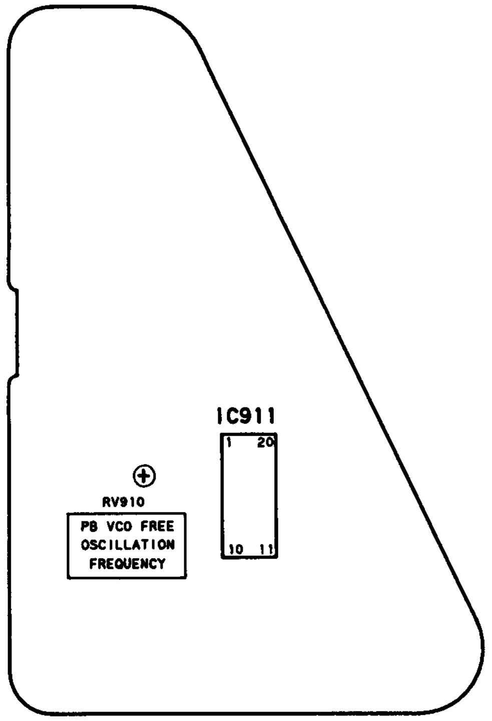
*: Indicates a adjustment element mounted on the conductor side.

AU-60P BOARD
(COMPONENT SIDE)

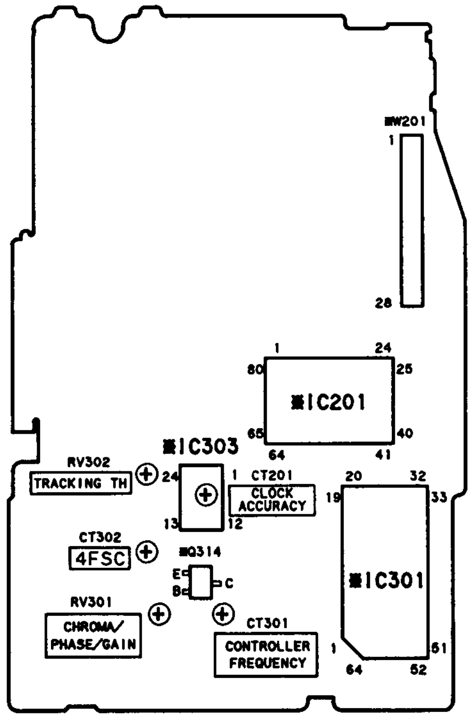

*IC404
37
48
RV408
DEVIATION
36
1
RV401
RECORDING MATRIX
RV402
PLAYBACK MATRIX
25
12
24
13
RV407
IR
RV405
IR
*IC403
37
48
36
1
25
12
24
13
RV404
DEVIATION
*W401
1
24
RV403
RECORDING AFM CARRIER LEVEL
RV406
RECORDING AFM CARRIER LEVEL

*: Indicates a adjustment element mounted on the conductor side.

CC-33P BOARD
(COMPONENT SIDE)


IC911
1
20
10
11
RV910
PB VCO FREE OSCILLATION FREQUENCY

FD-15P BOARD (COMPONENT SIDE)


*W201
1
28
1
24
80
*IC201
25
65
40
64
41
*IC303
RV302
TRACKING TH
24
1
CT201
CLOCK ACCURACY
13
12
20
32
19
33
CT302
4FSC
*Q314
E
B
C
*IC301
RV301
CHROMA/PHASE/GAIN
CT301
CONTROLLER FREQUENCY
1
64
52
61

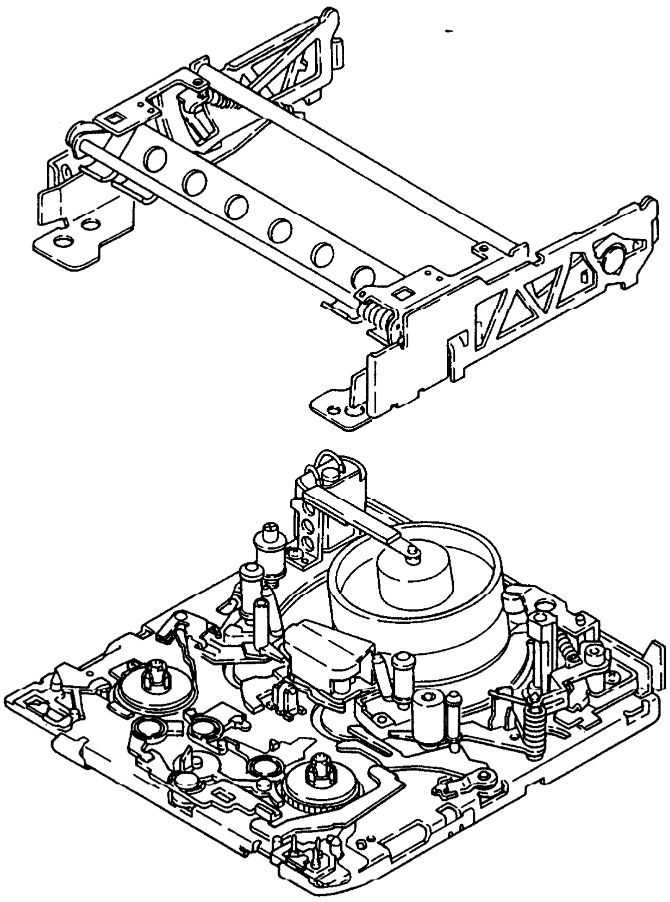
*: Indicates a adjustment element mounted on the conductor side.

mm Video MECHANICAL ADJUSTMENT MANUAL III

U MECHANISM

Video 8

Please use in conjunction with the SERVICE MANUAL.



8 MECHANISM DECK

SONY®

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1. PREPARATIONS FOR MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Note: For removal of the cabinet, the boards, the cassette compartment, etc., refer to the service guides.

1-1. OPERATION WITHOUT CASSETTE COMPARTMENT ASSEMBLY AND TAPE

Note: The unit will not work if exposed to a strong light.

1-1-1. How to Trigger the Loading Operation (See Fig. 1-1.)

1) Supply power to the unit after removing the cabinet, the camera block, the cassette compartment assembly, etc., as indicated in the service guides. (This will enable operation of the mechanical deck.)
2) Cover the LED assembly with an opaque cap, etc. ❶.
3) Attach a piece of tape to the RECOG switch ❷ so that the pin is held down.
4) Push the EJECT lever ❸ in the direction of the arrow Ⓐ.

1-1-2. Setting the Playback Mode (See Fig. 1-1.)

1) Follow the procedures in section 1-1-1. above.
2) Put the rubber band ❹ around the S and T reels.
3) Press the PLAY switch of unit, then push the tension regulator arm assembly ❺ in the direction of the arrow Ⓑ when the T reel starts to rotate (the tension regulator band will be released, and the S reel will start rotating).
4) To stop operation, press the STOP switch.

1-1-3. Eject Operation (See Fig. 1-1.)

1) To eject, turn the EJECT switch on.

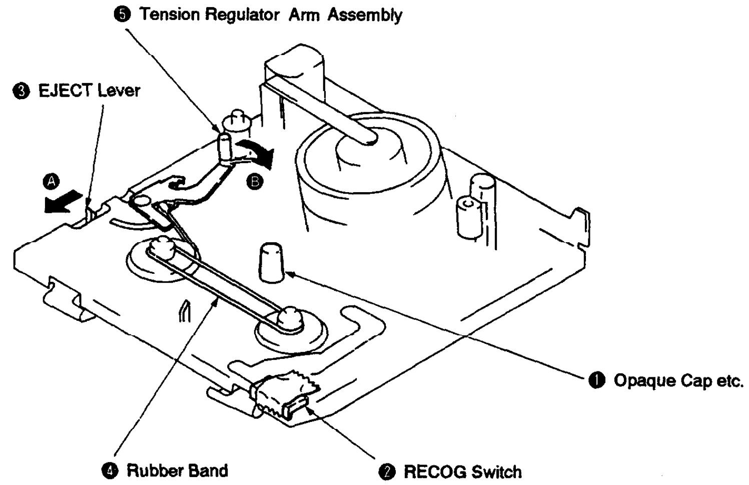


Fig. 1-1.

1-2. THE MODE SELECTOR

1-2-1. Name of Each Part (external) (See Fig. 1-2.)

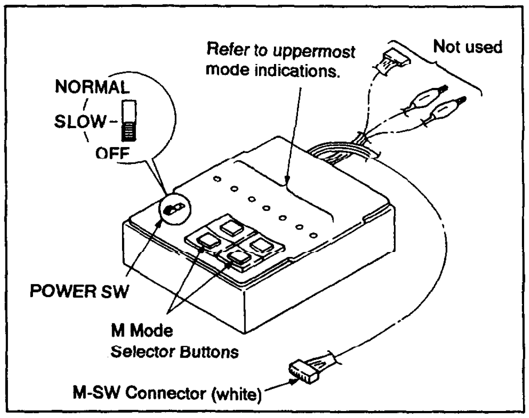

Refer to uppermost mode indications.
Not used
NORMAL
SLOW
OFF
POWER SW
M Mode Selector Buttons
M-SW Connector (white)

Fig. 1-2.

1-2-2. Connections (See Fig. 1-3.)

1) Mount the MODE SELECTOR III panel (Ref. No. J-9) ❶ onto the mode selector.
2) Attach the conversion connector (Ref. No. J-8) ❸ of MODE SELECTOR III to the 6-pin connector (white) ❷ of the mode selector M-SW.
3) Remove the FP-89 flexible board ❺ from the flexible connector ❹.
4) Attach the FP-89 flexible board ❺ to the flexible connector ❻ of the MODE SELECTOR III conversion connector ❸, then attach the 2-pin connector (white) ❽ of the loading motor to the 2-pin connector (white) ❼.

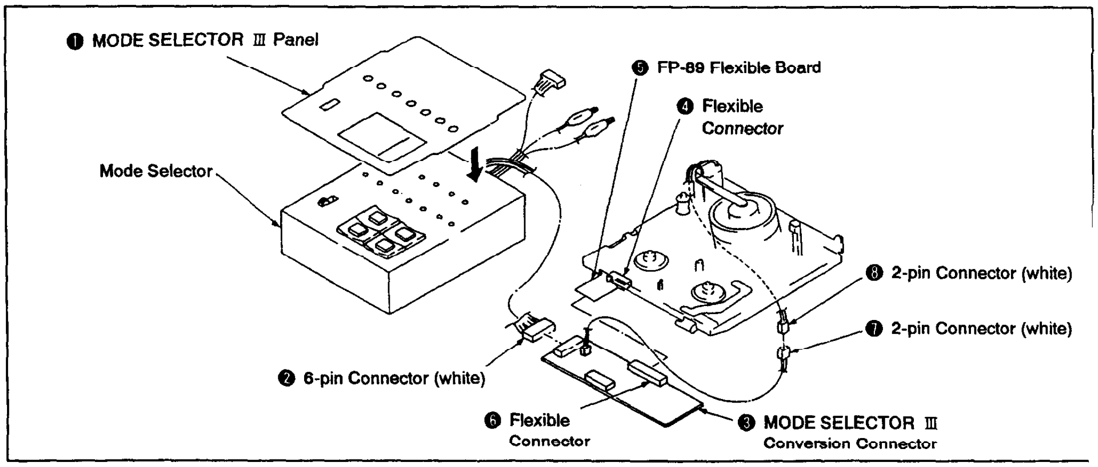

❶ MODE SELECTOR Ⅲ Panel
Mode Selector
❺ FP-89 Flexible Board
❹ Flexible Connector
❽ 2-pin Connector (white)
❼ 2-pin Connector (white)
❷ 6-pin Connector (white)
❻ Flexible Connector
❸ MODE SELECTOR Ⅲ Conversion Connector

Fig. 1-3.

1-2-3. Handling (See Figs. 1-2. and 1-4.)

- Use only the M mode selector buttons.
- Refer to mode indications on the uppermost part of the MODE SELECTOR III panel.
- If the right M mode selector button is kept pressed, the lit indication will change in the order of EJECT → (IA) → ULD → (IB) → STOP → (IC) → FWD.
- To change modes in the reverse direction (from FWD to EJECT), press the left selector button.

Note: For this U mechanism, the uppermost indicators on the MODE SELECTOR III panel are used. The IA, IB and IC indications light up during mode changes.

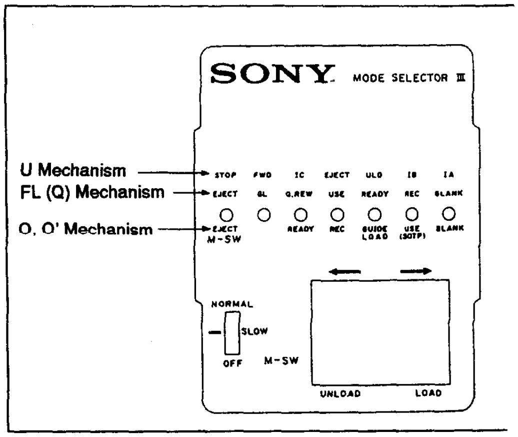

SONY MODE SELECTOR Ⅲ
U Mechanism
FL (Q) Mechanism
O, O' Mechanism
STOP
FWD
IC
EJECT
ULD
IB
IA
EJECT
GL
Q.REW
USE
READY
REC
BLANK
EJECT
M-SW
READY
REC
GUIDE LOAD
USE (SOTP)
BLANK
NORMAL
SLOW
OFF
M-SW
UNLOAD
LOAD

Fig. 1-4.

2. PERIODICAL CHECK AND MAINTENANCE (See Fig. 2-1.)

The following periodical check and maintenance procedures are necessary to ensure proper operation and to protect the tapes as well as the unit, and the following maintenance procedures must be always carried out after repairing regardless of how long the unit has been used.

2-1. ROTARY DRUM ASSEMBLY CLEANING

1) While pressing a piece of chamois leather (Ref. No. J-2) moistened in cleaning fluid (Ref. No. J-1) lightly against the rotary drum, turn the rotary upper drum slowly counter-clockwise with your fingers.

Note: Do not drive the drum with the motor, and do not turn it clockwise.
Do not move the chamois leather vertically against the head tip; this can damage the head tip. Strictly follow the cleaning instructions above.

2-2. TAPE PATH CLEANING

1) Set the cassette compartment assembly to the eject state, or remove it. Then clean the tape path (guides No. 1 to 7, capstan shaft, pinch rollers) with a piece of chamois leather moistened in cleaning fluid (See Fig. 2-1).

2-3. DRIVE SYSTEM CLEANING

1) Clean the drive system (timing belt, reel table surface) with a piece of cloth moistened in cleaning fluid.

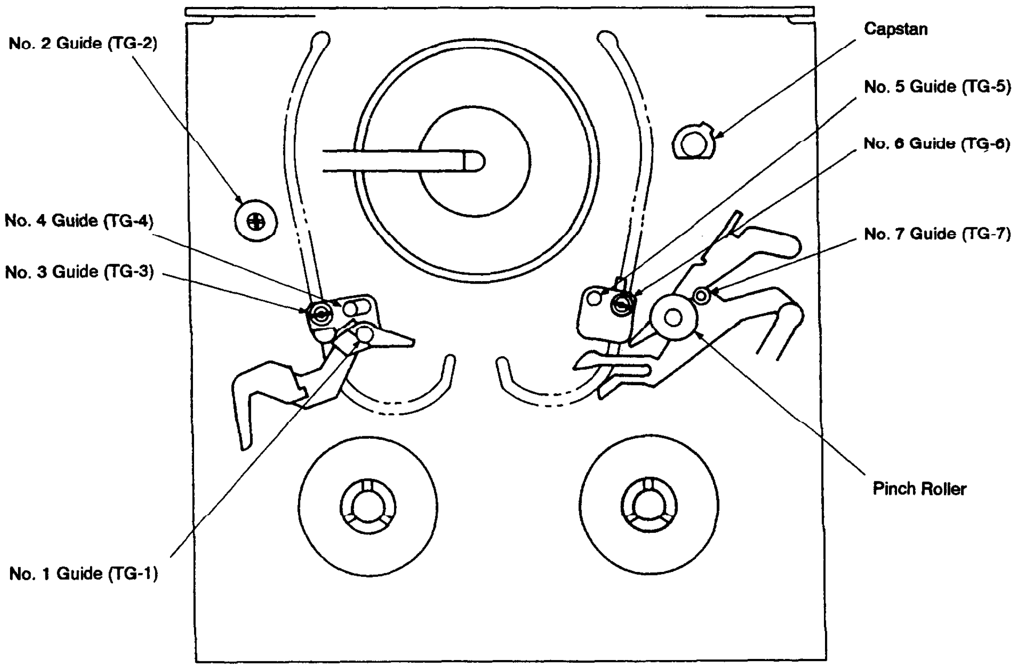


Fig. 2-1.

2-4. PERIODICAL CHECK ITEMS

○Cleaning ◎Lubrication ☆Check

Maintenance and Check Item		Operation time (H)										Remarks
		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	
Cleaning and Demag-netizing	Tape path surfaces Cleaning	○	○	○	○	○	○	○	○	○	○	Do not oil.
	Rotary drum assembly cleaning and demagnetizing	○	○	○	○	○	○	○	○	○	○	Do not oil.
Drive System	Relay belt (short)	–	☆	–	☆	–	☆	–	☆	–	☆	3-728-866-01
	Relay belt (long)	–	☆	–	☆	–	☆	–	☆	–	☆	3-728-865-01
	Capstan shaft	–	◎	–	◎	–	◎	–	◎	–	◎	Take care that no oil gets on tape path surfaces.
	Idler pulley axle	–	◎	–	◎	–	◎	–	◎	–	◎	
	Loading motor	–	☆	–	☆	–	☆	–	☆	–	☆	1-541-612-11
Perfor-mance Check	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	–	☆	–	☆	–	☆	–	☆	–	☆	
	Brake system	–	☆	–	☆	–	☆	–	☆	–	☆	
	FWD, RVS torque measurement	–	☆	–	☆	–	☆	–	☆	–	☆	

Notes: When overhauling the unit, perform parts replacement referring to the table above.

Regarding Oil:

- Always use the specified oil (using oil of different viscosity, etc. can cause troubles of several kinds).
  Specified oil: Part No. 7-661-018-01
  (Mitsubishi Diamond Oil Hydrofluid EP56)
- Be sure that no dirt is mixed in the oil to be used on axle bearings. Use of dirty oil can result in bearing wear and burning.
- By "one drop of oil" is meant the quantity of oil adhering to the end of a a 2mm-diameter rod as shown in Fig. 2-2.

On grease:

- Use the specified grease.
  Grease: Part No. 7-662-010-08
  (Sony grease SGL-701)

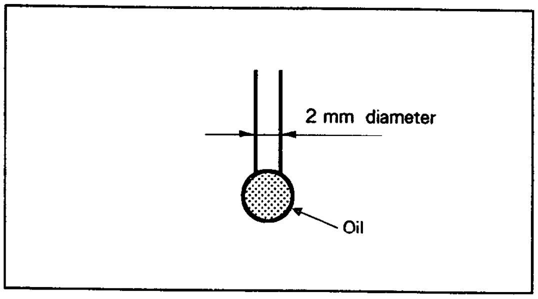


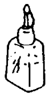
Fig. 2-2.

2-5. SERVICING TOOLS

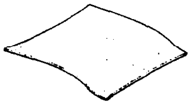
Ref. No.	Name	Part Code	Marking	Application, etc.
J-1	Cleaning fluid	Y-2031-001-0	–	
J-2	Chamois cloth	2-034-697-00	–	
J-3	Head demagnetizer	Commercially available	–	
J-4	Dental mirror Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-5	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-6	FWD/RVS takeup torque cassette	J-6080-624-A	GD-2086	
J-7	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-8	Mode selector III conversion connector	J-6082-021-A		General
J-9	Mode selector III panel	J-6082-023-A		General
J-10	Mode selector	J-6080-825-A		General
J-11	Hexagonal wrench detection (0.89 mm) or L wrench (0.89 mm)	7-700-766-01 7-700-736-06		Tape path
J-12	Sony grease (SGL-701)	7-662-010-08		

Other devices: Oscilloscope
Analog tester (20 kΩ)

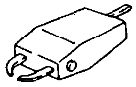
J-1



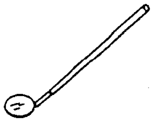
J-2



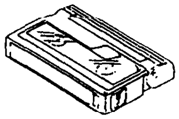
J-3



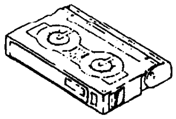
J-4



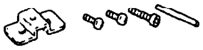
J-5



J-6

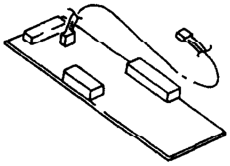


J-7

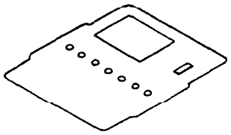


(Attached to the maintenance rotary upper drum)

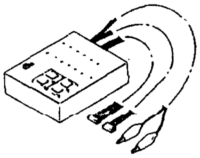
J-8



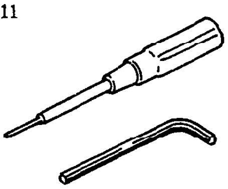
J-9



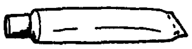
J-10



J-11



J-12



3. MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Notes:
- Use the mode selector (Ref. No. J-10) for procedures in this chapter.
- Modes within a frame ☐ are those set by pressing the buttons of the mode selector.

3-1. HC ROLLER ASSEMBLY

1. Removal (See Fig. 3-1.)

1) Remove the screw ❶, then remove the HC roller assembly ❷.

2. Installation (See Fig. 3-1.)

1) Align the two dowels ❸ attached to the HC roller assembly ❷ with the two holes ❹ in the mechanism chassis.
2) Secure the HC roller assembly ❷ with the screw ❶.

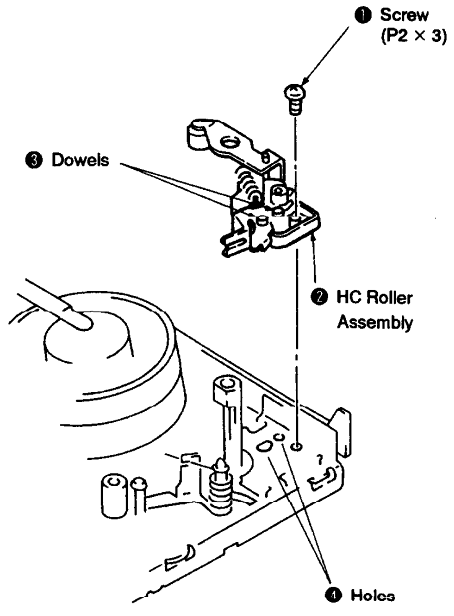

❶ Screw
(P2 × 3)
❸ Dowels
❷ HC Roller
Assembly
❹ Holes

Fig. 3-1.

3-2. GUIDE GUARD ASSEMBLY

1. Removal (See Fig. 3-2.)

Remove the screw ❶, then remove the guide guard assembly ❷.

2. Installation (See Fig. 3-2.)

1) Align the dowel ❸ attached to the guide guard assembly ❷ with the hole ❹.
2) Secure the guide guard assembly ❷ with the screw ❶.

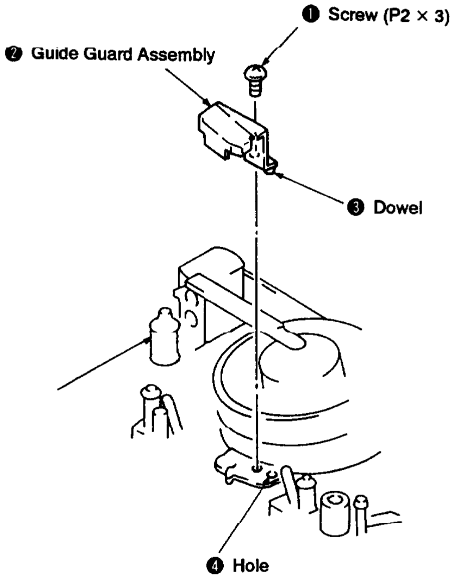

❶ Screw (P2 × 3)
❷ Guide Guard Assembly
❸ Dowel
❹ Hole

Fig. 3-2.

3-3. DC MOTOR (CAPSTAN MOTOR) ASSEMBLY

1. Removal (See Fig. 3-3.)

1) Set the ULD mode.
2) Turn the stopper ❶ in the direction of the arrow Ⓐ as far as it will go.
3) Remove the two screws ❷, then remove the DC motor ❸.

2. Installation (See Fig. 3-3.)

1) Align the two screwed dowels ❹ with the two holes ❺, then engage the toothed part ❻ with the connecting gear ❼.
2) Secure the DC motor assembly ❸ with the two screws ❷.
3) Turn the stopper ❶ in the direction of the arrow Ⓑ as far as it will go.

Note:
- When engaging the gears, take care not to damage their teeth.
- Do not leave any clearance between the DC motor ❸ and the chassis.
- Do not touch the capstan motor axle*, the oil seal* and the rotor*.

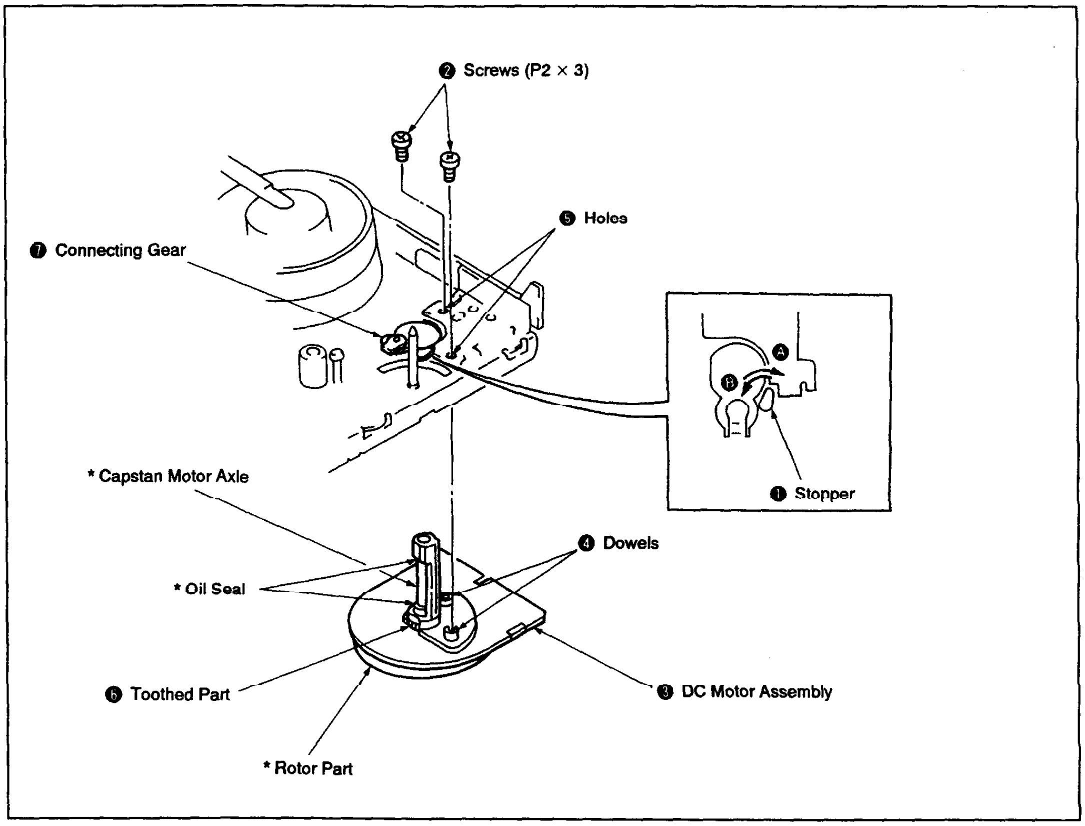

❷ Screws (P2 × 3)
❺ Holes
❼ Connecting Gear
Ⓐ
Ⓑ
❶ Stopper
* Capstan Motor Axle
❹ Dowels
* Oil Seal
❻ Toothed Part
❸ DC Motor Assembly
* Rotor Part

Fig. 3-3.

3-4. S BRAKE, T BRAKE

1. Removal (See Fig. 3-4.)

1) Remove the torsion coil spring (ST) ①.
2) Remove the axle holding pin ②, then remove the T brake ③.
3) Remove the axle holding pin ④, then remove the S brake ⑤.

2. Installation (See Fig. 3-4.)

1) While fitting the toothed part ⑥ into the notch ⑦, mount the S brake ⑤.
2) Insert the axle holding pin ④.
3) Insert the axle ⑧ to the S reel side of the brake release arm ⑨ so that the Ⓐ part comes closer to the drum than part Ⓑ, and mount the T brake ③.
4) Insert the axle holding pin ②.
5) Insert the torsion coil spring (ST) ① below the claw ⑪ of the axle ⑩, then hook it to two claws ⑫.

Note: Confirm that the claws of axle holding pins ② and ④ are not broken before assembling.

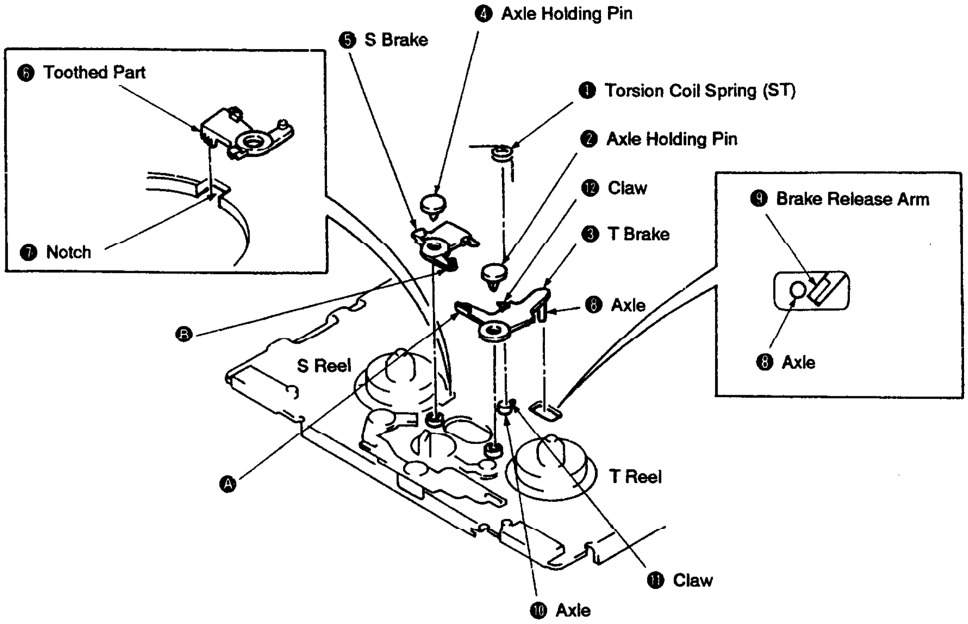

④ Axle Holding Pin
⑤ S Brake
⑥ Toothed Part
⑦ Notch
① Torsion Coil Spring (ST)
② Axle Holding Pin
⑫ Claw
③ T Brake
⑨ Brake Release Arm
⑧ Axle
⑧ Axle
Ⓑ
S Reel
Ⓐ
T Reel
⑪ Claw
⑩ Axle

Fig. 3-4.

3-5. LB BRAKE, AXLE HOLDING PINS

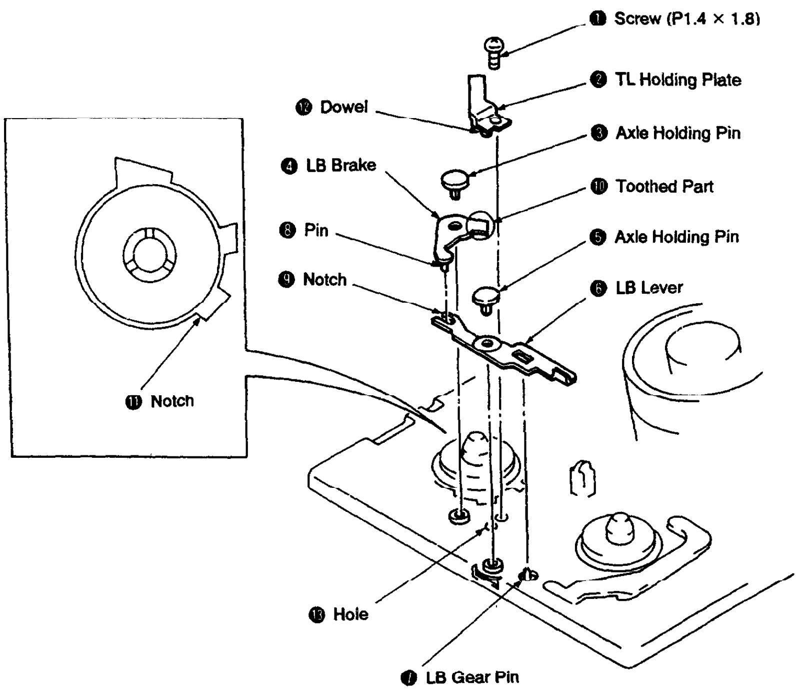
1. Removal (See Fig. 3-5.)

1) Remove the screw ❶, then remove the TL holding plate ❷.
2) Remove the axle holding pin ❸, then remove the LB brake ❹.
3) Remove the axle holding pin ❺, then remove the LB lever ❻.

2. Installation (See Fig. 3-5.)

1) Mount the LB lever ❻ matching it to pin ❼ of the LB gear, then secure it with the axle holding pin ❺.
2) Insert the pin ❽ into the notch ❾ of the LB lever ❻, then mount the LB brake ❹ while inserting the toothed part ❿ into the notch ⓫.
3) Insert the axle holding pin ❸.
4) Align the dowel ⓬ with the hole ⓭, then mount the TL holding plate and secure it with the screw ❶.

Note: Confirm that the claws of axle holding pins ❸ and ❺ are not broken before assembling.



❶ Screw (P1.4 × 1.8)
❷ TL Holding Plate
⓬ Dowel
❸ Axle Holding Pin
❹ LB Brake
❿ Toothed Part
❽ Pin
❺ Axle Holding Pin
❾ Notch
❻ LB Lever
⓫ Notch
⓭ Hole
❼ LB Gear Pin

Fig. 3-5.

3-6. LB RELEASE ARM

1. Removal (See Fig. 3-6.)

1) While pushing the claw ❶ in the direction of the arrow, remove the LB release arm ❷.

2. Installation (See Fig. 3-6.)

1) Fit the LB release arm ❷ to the axle ❸, insert protrusions ⓐ, ⓑ, ⓒ, ⓓ into the three holes ❹, then secure with the claw ❶.

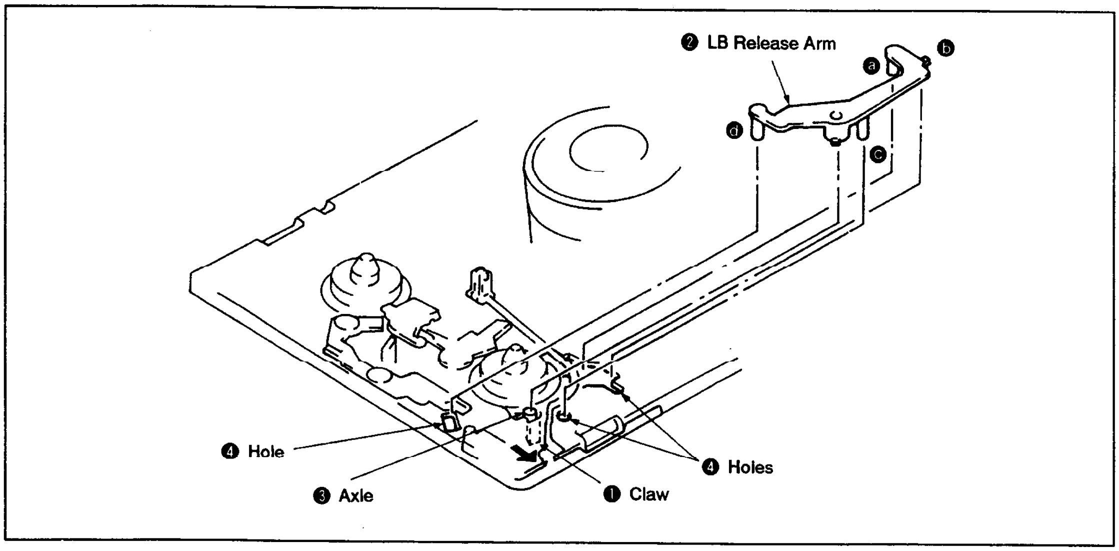

❷ LB Release Arm
ⓐ
ⓑ
ⓓ
ⓒ
❹ Hole
❸ Axle
❹ Holes
❶ Claw

Fig. 3-6.

3-7. RK STOPPER, RK STOPPER ARMS

1. Removal (See Fig, 3-7.)

1) Remove the torsion coil spring (RK) ❶.
2) Open the chassis claw ❷, then remove the RK stopper arm ❸.
3) Remove the RK stopper ❹.

2. Installation (See Fig. 3-7.)

1) Mount the RK stopper ❹ onto the axle ❺.
2) Mount the RK stopper arm ❸ onto the axle ❻, insert Pin ❿ into hole ⓫, then hook the claw ❷ of the chassis to the hole ❼.
3) Insert the torsion coil spring (RK) ❶ into the axle ❺, then hook it to claws ❽ and ❾.

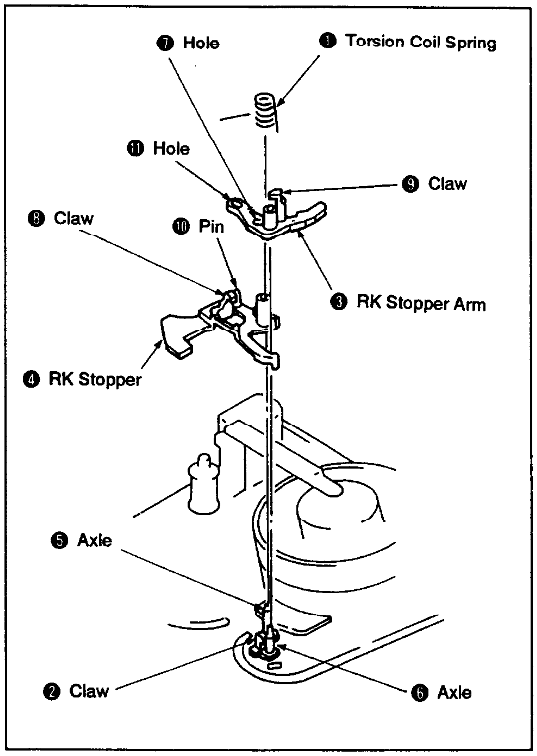

❼ Hole
❶ Torsion Coil Spring
⓫ Hole
❾ Claw
❽ Claw
❿ Pin
❸ RK Stopper Arm
❹ RK Stopper
❺ Axle
❷ Claw
❻ Axle

Fig. 3-7.

3-8. PINCH ARM ASSEMBLY, TG-7 ASSEMBLY

1. Removal (See Fig. 3-8.)

1) Set the IB mode.
2) Remove the stopper washer ❶, then remove the pinch arm assembly ❷.
3) Bend the claw ❹ inside hole ❸ in the direction of the arrow using a thin screwdriver or the like, then remove the TG-7 plate spring ❺.
4) Remove the TG-7 arm assembly ❻.

2. Installation (See Fig. 3-8.)

1) Grease the inner surfaces of hole ❼ (See Fig. A).
2) Insert the axle ❽ of the TG-7 arm assembly ❻ into the hole ❼.
3) Grease the shaded section ⓐ (See Fig. A).
4) Insert the TG-7 plate spring ❺ into the hole ❸, then secure it with the claw ❹.
5) Apply half a drop of oil to the axle ❾ (See Fig. B).
6) Fit the pinch arm assembly ❷ to the axle ❾ and insert the pinch roller sub arm assembly tab ❿ into the ⓑ part.
7) Install the stopper washer ❶.

Note:
- Take care not to grease the screw ⓫ of the TG-7 arm assembly ❻ (See Fig. A).
- When fitting the pinch arm assembly ❷ to the axle ❾, make sure that it does not touch the TG-7 guide ⓬ or the rubber roller ⓭.
- After assembling, be sure to perform tape path adjustment as described in section 4.

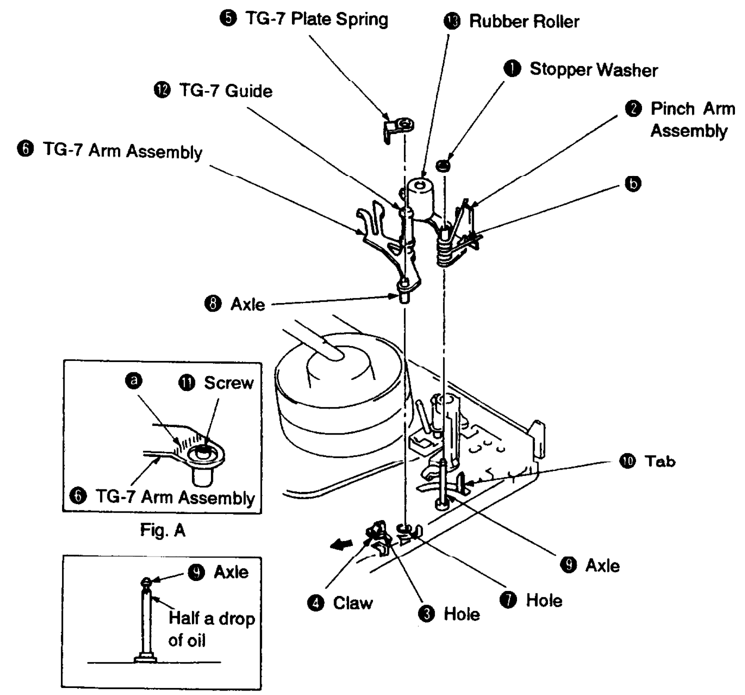

❺ TG-7 Plate Spring
⓭ Rubber Roller
❶ Stopper Washer
⓬ TG-7 Guide
❷ Pinch Arm Assembly
❻ TG-7 Arm Assembly
ⓑ
❽ Axle
ⓐ
⓫ Screw
❻ TG-7 Arm Assembly
❿ Tab
❾ Axle
Half a drop of oil
❾ Axle
❹ Claw
❸ Hole
❼ Hole

Fig. A

Fig. B

Fig. 3-8.

3-9. TG-2 ASSEMBLY

1. Removal (See Fig. 3-9.)

1) Remove the TG-2 upper flange assembly ❶.
2) Remove the TG-2 roller ❷, the TG-2 sleeve ❸, the TG-2 lower flange ❹ and the compression spring ❺.

2. Installation (See Fig. 3-9.)

1) Mount the compression spring ❺, the TG-2 lower flange ❹, the TG-2 sleeve ❸ and the TG-2 roller ❷ to the axle.
2) Secure the TG-2 upper flange ❶ to the axle by rotating it 4 to 6 turns.

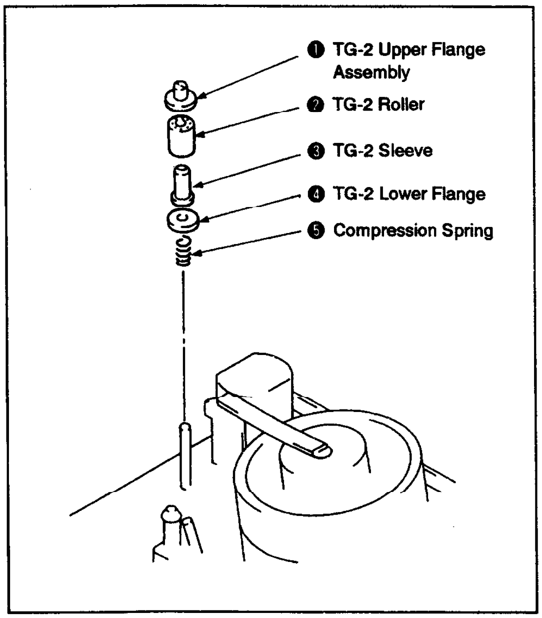

❶ TG-2 Upper Flange Assembly
❷ TG-2 Roller
❸ TG-2 Sleeve
❹ TG-2 Lower Flange
❺ Compression Spring

Fig. 3-9.

3. TG-2 Height Preset (see Fig. 3-10.)

1) Adjust height from the mechanism chassis upper surface to the TG-2 upper flange ❶ upper surface to 18.6 mm by turning the TG-2 upper flange ❶.

Note: After adjustment, be sure to perform tape path adjustment as described in section 4.

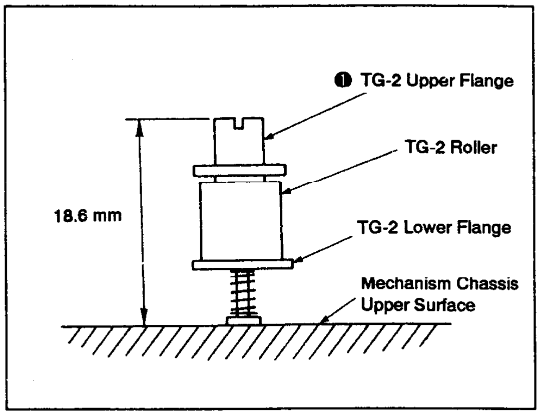

❶ TG-2 Upper Flange
TG-2 Roller
18.6 mm
TG-2 Lower Flange
Mechanism Chassis Upper Surface

Fig. 3-10.

3-10. S REEL TABLE ASSEMBLY, T REEL TABLE ASSEMBLY

1. Removal (See Fig. 3-11.)

1) Remove the S brake and T brake as described in section 3-4.
2) Remove the TL holding plate as described in section 3-5.
3) Remove the tension regulator band assembly as described in section 3-11.
4) Remove the S reel table assembly ❶.
5) Turn the stopper ❷ approx. 90 ° in the direction of the arrow Ⓐ.
6) While sliding the LB release arm ❸ in the direction of the arrow Ⓑ, remove the T reel table assembly ❹.

2. Installation (See Fig. 3-11.)

1) Apply half a drop of oil to the axle ❺ (See Fig. A).
2) Move the RK gear ❻ in the direction of the arrow Ⓒ and the TS brake ❼ in the direction of the arrow Ⓓ, putting them out of the way.
3) While sliding the LB release arm ❸ in the direction of the arrow Ⓑ, mount the T reel table assembly ❹ onto the axle ❺, then turn the stopper ❷ in the direction of the arrow Ⓔ as far as it will go.
4) Apply half a drop of oil to the axle ❽ (See Fig. B).
5) Move the RK gear ❻ in the direction of the arrow Ⓕ, the UL brake ❾ in the direction of the arrow Ⓖ and the LB brake ❿ in the direction of the arrow Ⓗ, putting them out of the way.
6) Mount the S reel table ❶ onto the axle ❽.
7) Mount the tension regulator band assembly as described in section 3-11.
8) Mount the TL holding plate as described in section 3-5.
9) Mount the S brake and T brake assemblies as described in section 3-4.

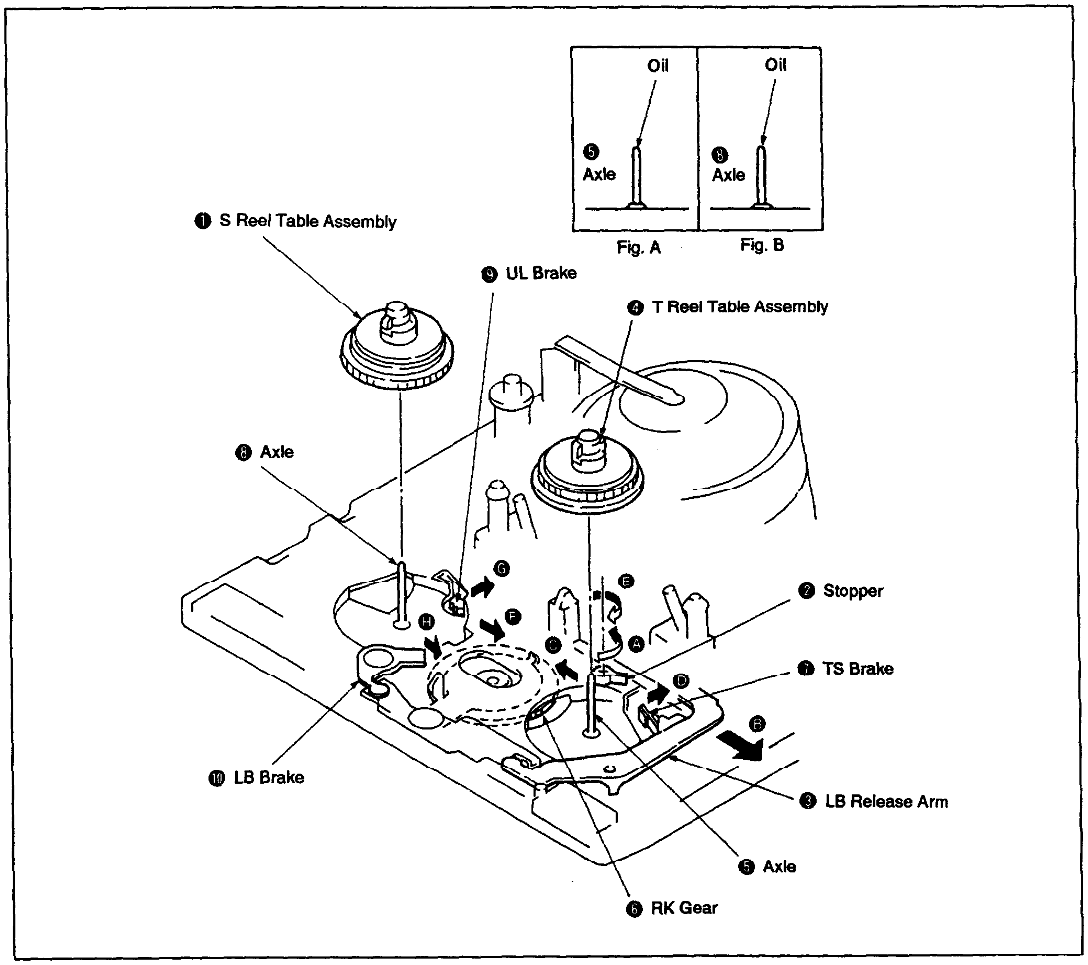

Oil
Oil
❺ Axle
❽ Axle
Fig. A
Fig. B
❶ S Reel Table Assembly
❾ UL Brake
❹ T Reel Table Assembly
❽ Axle
Ⓖ
Ⓔ
Ⓕ
Ⓗ
Ⓒ
Ⓐ
Ⓓ
Ⓑ
❷ Stopper
❼ TS Brake
❿ LB Brake
❸ LB Release Arm
❺ Axle
❻ RK Gear

Fig. 3-11.

3-11. TENSION REGULATOR BAND ASSEMBLY, TENSION REGULATOR ARM ASSEMBLY

1. Removal (See Fig. 3-12.)

1) Remove the TL holding plate as described in section 3-5.
2) Remove the screw ❶.
3) Using a thin screwdriver or the like, remove the tension regulator band assembly ❹ from the axle ❸ of tension regulator arm assembly ❷.
4) Remove the tension spring ❺.
5) Remove the stopper washer ❻ from the back of the mechanism chassis, then remove the tension regulator arm assembly ❷.
6) Open the claw ❼, then remove the adjust arm ❽.

Note: When removing the tension regulator band assembly ❹, take care not to twist or bend it, and not to touch the felt surface ❾.

2. Installation (See Fig. 3-12.)

1) Engage the adjust arm ❽ in the position shown in Fig. A, then close the claw ❼.
2) Apply half a drop of oil to the hole ❿.
3) Mount the tension regulator arm assembly ❷, then insert it into the slot ⓫ so that the ⓐ part comes to the arrow Ⓐ side of the switch lever assembly (See Fig. B).
4) While holding the tension regulator arm assembly ❷ from the mechanism chassis front, secure it with the stopper washer ❻ from the back.
5) Hook the R hook of the tension spring ❻ to the adjust arm ❽ as shown in the figure, then hook the opposite end to the tension regulator arm assembly ❷.
6) Mount the tension regulator band assembly ❹ onto the axle ❸ of tension regulator arm assembly ❷, and place it so that the felt surface ❾ comes against the shaded portion of the S reel table assembly ⓬.
7) Mount the tension regulator plate ⓭ of the tension regulator band assembly ❹ so that it is aligned with the dowel ⓮ of the mechanism chassis, then secure it temporarily with the screw ❶.
8) Mount the TL holding plate as described in section 3-5.
9) Adjust tension regulator FWD position as described in section 3-12.
10) Perform adjust arm adjustment as described in section 3-22.

Note: When mounting the tension regulator band assembly ❷, take care not to twist or bend it, and not to touch the felt surface ❾.

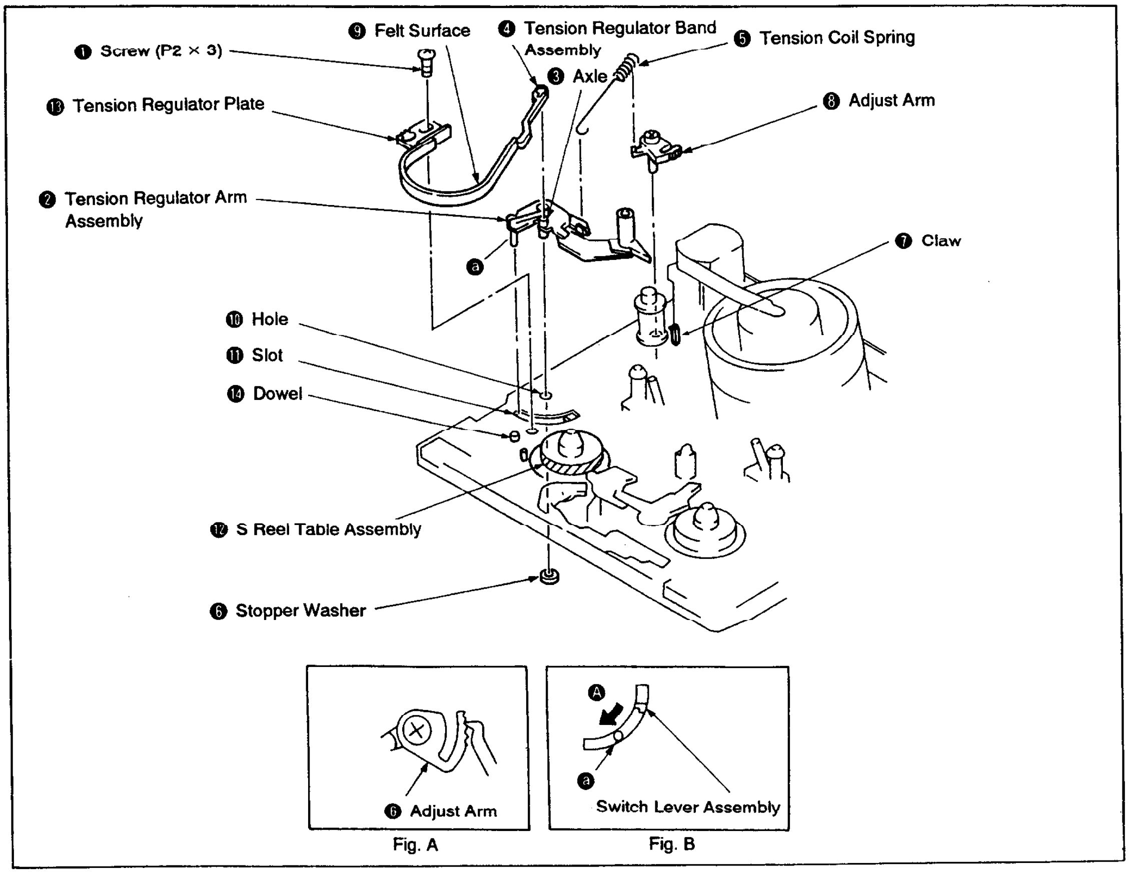

❶ Screw (P2 × 3)
❾ Felt Surface
❹ Tension Regulator Band Assembly
❸ Axle
❺ Tension Coil Spring
⓭ Tension Regulator Plate
❽ Adjust Arm
❷ Tension Regulator Arm Assembly
ⓐ
❼ Claw
❿ Hole
⓫ Slot
⓮ Dowel
⓬ S Reel Table Assembly
❻ Stopper Washer
❻ Adjust Arm
Ⓐ
ⓐ
Switch Lever Assembly

Fig. A

Fig. B

Fig. 3-12.

3-12. TENSION REGULATOR FWD POSITION PRESET (See Fig. 3-13.)

1) Load a cassette tape and set the FWD mode.
2) Confirm whether the distance between ⓐ part of the tension regulator arm ❶ and the groove ❷ of the chassis is 1.1 ± 0.3 mm. If this distance is not within the specified range, remove the cassette tape and perform the following adjustment.
3) Loosen the fixing screw ❹ of the tension regulator band assembly ❸.
4) Slide the tension regulator plate ❺ in the direction of the arrow Ⓐ if the measured distance is over the specified range, and in the direction of the arrow Ⓑ if it is under that range. Then, fix it with the screw ❹.
5) Repeat steps 1) and 2) and confirm that the distance is within the specified range.

Note: Use a cassette with the tape advanced halfway.

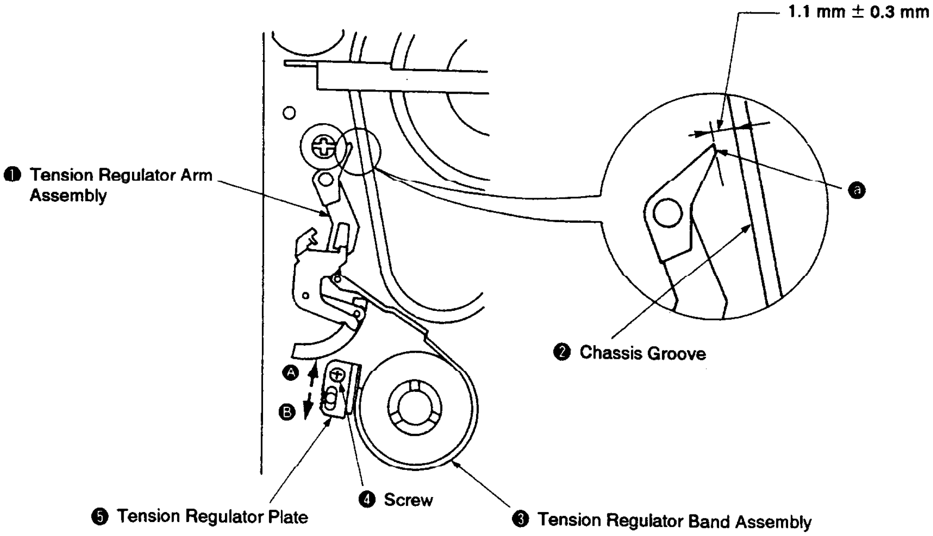

1.1 mm ± 0.3 mm
❶ Tension Regulator Arm Assembly
ⓐ
❷ Chassis Groove
Ⓐ
Ⓑ
❺ Tension Regulator Plate
❹ Screw
❸ Tension Regulator Band Assembly

Fig. 3-13.

3-13. DRUM ASSEMBLY, DEW SENSOR

1. Removal (See Fig. 3-14.)

1) Set the EJECT mode.
2) Remove the flexible board ❶ and the two connectors ❷.
3) Remove the guide guard assembly as described in section 3-2.
4) Remove the screw ❸, then remove the axle ground terminal ❹.
5) Remove the three screws ❺, then remove the drum assembly ❻ from the mechanism chassis.
6) Remove the connector ❿
7) Remove the screw ❼, then remove the dew sensor ❽.

Note:
- When removing the drum assembly ❻ from the mechanism chassis, take care not to cut the flexible board ❶ or the harness.
- Take care not to touch the head tip ❾.

2. Installation (See Fig. 3-14.)

1) Insert part Ⓐ of the dew sensor ❽ into the notch ⓫ of the mechanism chassis, then secure it with the screw ❼.
2) Mount the connector ❿.
3) Clamp the harness ⓯ of the dew sensor ❽ with the reinforcing the claw ⓰ of the plate SS assembly (See Fig. A).
4) Insert the connector ❷ and the flexible board ❶ into the hole ⓬ of the mechanism chassis, align the drum assembly ❻ with the two dowels ⓭ and secure it with the three screws ❺.
5) Align the axle ground terminal ❷ with the two dowels ⓮ of the mechanism chassis and secure it with the screw ❸.
6) Mount the guide guard assembly as described in section 3-2.
7) Mount the two connectors ❷ and the flexible board ❶.

Note:
- Take care not to cut the flexible board ❶ or the harness ⓯.
- Take care not to touch the head tip ❾.
- After assembling, be sure to perform Tape Path Adjustment following instructions in section 4.

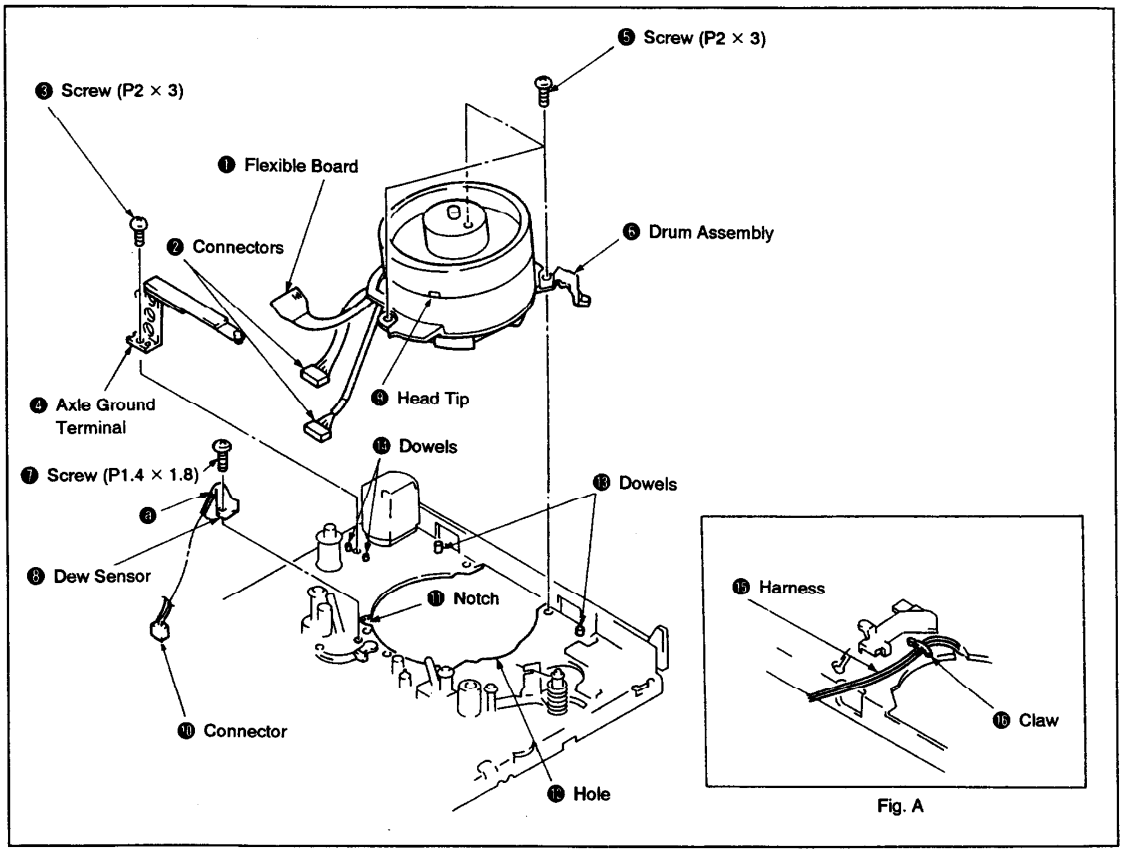

❺ Screw (P2 × 3)
❸ Screw (P2 × 3)
❶ Flexible Board
❷ Connectors
❻ Drum Assembly
❹ Axle Ground Terminal
❾ Head Tip
⓮ Dowels
❼ Screw (P1.4 × 1.8)
ⓐ
⓭ Dowels
❽ Dew Sensor
⓫ Notch
❿ Connector
⓬ Hole
⓯ Harness
⓰ Claw
Fig. A

Fig. 3-14.

3-14. EJECT LEVER, SWITCH LEVER ASSEMBLY, PINCH ROLLER SUB ARM ASSEMBLY

1. Removal (See Fig. 3-15.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Set the STOP mode.
3) Remove the claw ❶, then remove the eject lever ❷.
4) Remove the stopper washer ❸, then remove the switch lever assembly ❹.
5) Remove the pinch roller load spring ❺.
6) Remove the stopper washer ❻, then remove the pinch roller sub arm assembly ❼.

2. Installation (See Fig. 3-15.)

1) Grease the axle ❽ (See Fig. A).
2) Assemble by inserting ⓐ part of the pinch roller sub arm assembly ❼ into the slot ❾, then insert the pin ❿ into the loading lever assembly notch ⓫.
3) Secure with the stopper washer ❻.
4) Mount the pinch roller load spring ❺ by catching its ⓑ end between the claw ⓬ and the chassis side and its ⓒ end to the claw ⓬.
5) Apply half a drop of oil to the axle ⓭ (See Fig. B).
6) Align the groove ⓮ of the switch lever assembly ❹ with the mode detector switch protrusion ⓯, mount it on the axle ⓭, then insert the pin ⓰ into the drive gear (left) assembly ⓱ outer groove.
7) Secure with the stopper washer ❸.
8) Mount the eject lever ❷ and close the claw ❶.
9) Mount the DC motor (capstan motor) as described in section 3-3.

Note: When mounting the switch lever assembly ❹ onto the axle ⓭ with the tension regulator arm assembly installed, set the pin ⓰ to the arrow Ⓐ side of the switch lever assembly ❹.

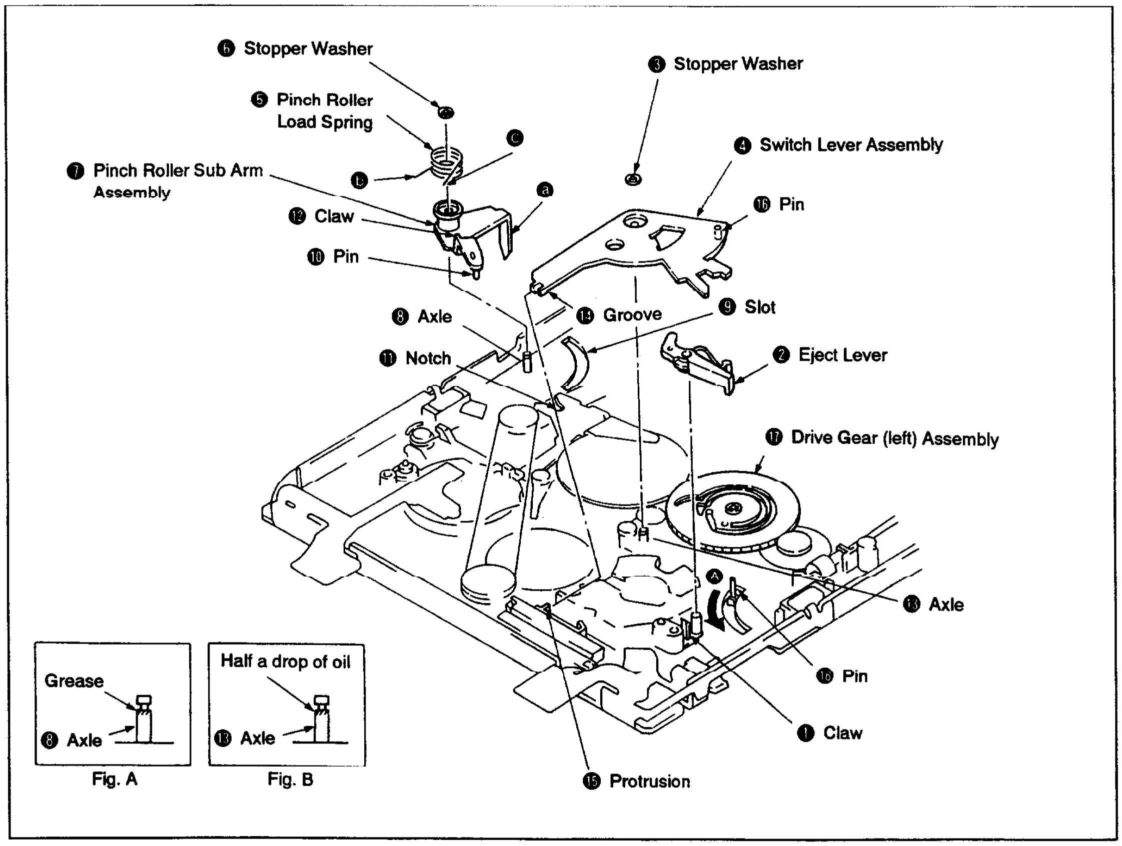

❻ Stopper Washer
❺ Pinch Roller Load Spring
ⓒ
❼ Pinch Roller Sub Arm Assembly
ⓑ
ⓐ
⓬ Claw
❿ Pin
❸ Stopper Washer
❹ Switch Lever Assembly
⓰ Pin
❽ Axle
⓮ Groove
❾ Slot
⓫ Notch
❷ Eject Lever
⓱ Drive Gear (left) Assembly
Ⓐ
⓭ Axle
⓰ Pin
❶ Claw
⓯ Protrusion
Grease
❽ Axle
Half a drop of oil
⓭ Axle

Fig. A

Fig. B

Fig. 3-15.

3-15. TIMING BELT (L) , RC GEAR ASSEMBLY, LOADING LEVER ASSEMBLY, TIMING BELT (S), CONNECTING GEAR ASSEMBLY

1. Removal (See Fig. 3-16.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the pinch roller sub arm assembly as described in section 3-14.
3) Set the STOP mode.
4) Remove the stopper washer ❶ , then remove the RC gear assembly ❷ from the axle ❹ with the timing belt (L) ❸ attached.
5) Remove the timing belt (L) ❸ from the idler pulley assembly ❺.
6) Remove the stopper washer ❻ and remove the loading lever assembly ❽ while pushing the claw ❼ in the direction of the arrow Ⓐ.
7) Turn the stopper ❾ approx. 90 ° in the direction of the arrow Ⓑ.
8) Remove the connecting gear assembly ⓫ from the axle ⓰ with the timing belt (S) ❿ attached.
9) Remove the timing belt (S) ❿ from the idler pulley assembly ❺.

Note: When removing the connecting gear ⓫ , take care not touch the flange section ⓑ.

2. Installation (See Fig. 3-16.)

1) Apply half a drop of oil to the axle ⓰ (See Fig. F).
2) Hook one end of the timing belt (S) ❿ onto the connecting gear assembly ⓫ and the other end onto gear ⓓ of the idler pulley assembly ❺. (Refer to the figure.)
3) Mount the connecting gear assembly ⓫ with the timing belt (S) ❿ attached to the axle ⓰.
4) Turn the stopper ❾ in the direction of the arrow Ⓒ as far as it will go.
5) Apply half a drop of oil to the axle ⓬ (See Fig. A).
6) Fit the loading lever assembly ❽ to the axle ⓬, secure the ⓐ part with the claw ❼ and place the pin ⓭ into the groove of the drive gear (right) assembly ⓮.
7) Install the stopper washer ❻.
8) Place the timing belt (L) ❸ around the gears of the RC gear assembly ❷ indicated in Fig. B, and its opposite side around the gear ⓒ of the idler pulley assembly ❺. (See Fig. E.)
9) Mount the RC gear assembly ❷ onto the axle ❹ with the timing belt (L) ❸ attached, and engage it with the gear of the RK gear assembly ⓯.
10) Install the stopper washer ❶.
11) Grease parts of the loading lever assembly ❽ indicated in Fig. C.
12) Mount the pinch roller sub arm assembly as described in section 3-14.
13) Mount the DC motor (capstan motor) as described in section 3-3.

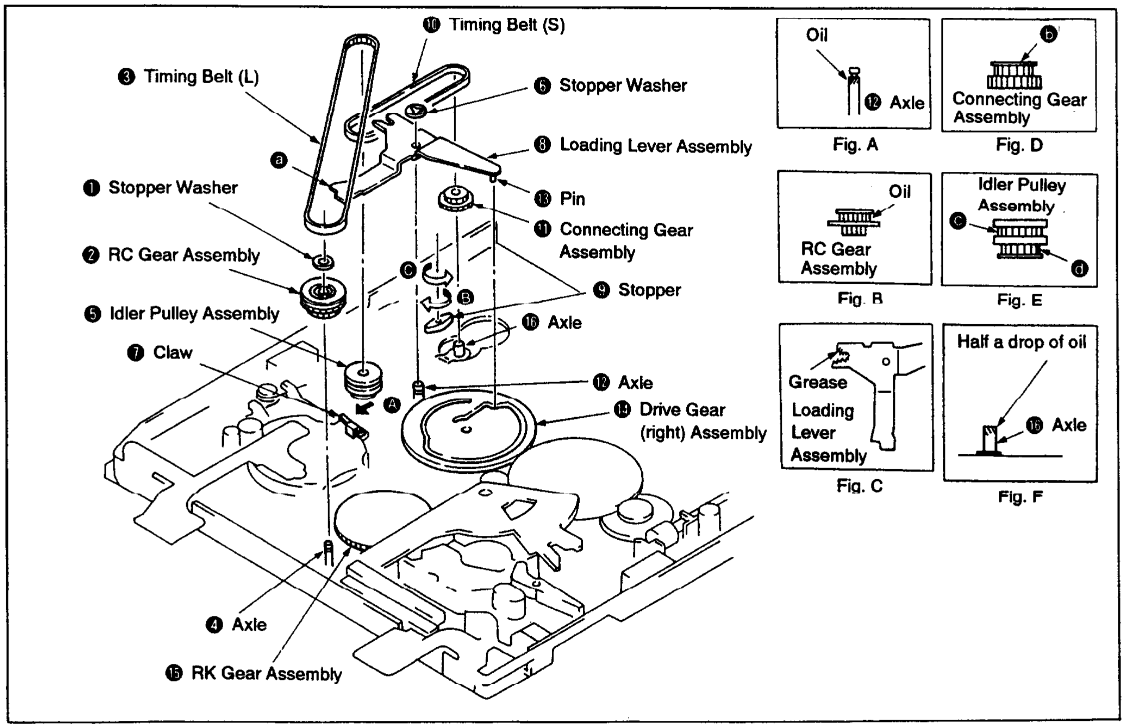

❿ Timing Belt (S)
❸ Timing Belt (L)
❻ Stopper Washer
❽ Loading Lever Assembly
ⓐ
❶ Stopper Washer
⓭ Pin
⓫ Connecting Gear Assembly
❷ RC Gear Assembly
Ⓒ
Ⓑ
❾ Stopper
❺ Idler Pulley Assembly
⓰ Axle
❼ Claw
⓬ Axle
Ⓐ
⓮ Drive Gear (right) Assembly
❹ Axle
⓯ RK Gear Assembly
Oil
⓬ Axle
ⓑ
Connecting Gear Assembly
Oil
RC Gear Assembly
Idler Pulley Assembly
ⓒ
ⓓ
Grease
Loading Lever Assembly
Half a drop of oil
⓰ Axle

Fig. A

Fig. D

Fig. B

Fig. E

Fig. C

Fig. F

Fig. 3-16.

3-16. IDLER PULLEY, TS BRAKE ASSEMBLY, LB GEAR ASSEMBLY, RK GEAR ASSEMBLY

1. Removal (See Fig. 3-17.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the switch lever assembly as described in section 3-14.
3) Remove the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly described in section 3-15.
4) Set the STOP mode.
5) Remove the stopper washer ❶, then remove the idler pulley ❷.
6) Open the claw ❸, then remove the TS brake assembly ❹.
7) Remove the torsion coil spring (LB) ❺.
8) Remove the stopper washer ❻, then remove the LB gear assembly ❼.
9) Remove the RK gear assembly ❽.

Note: When removing the idler pulley ❷, take care not to touch the flange section ⓐ. (See Fig. C.)

2. Installation (See Fig. 3-17.)

1) Apply half a drop of oil to the axle ❾ (See Fig. A).
2) Mount the RK gear assembly ❽ onto the axle ❾, keeping it in horizontal position.
3) Apply half a drop of oil to the axle ❿ (See Fig. B).
4) Mount the LB gear assembly ❼ onto the axle ❿ and secure it with the stopper washer ❻.
5) Insert the torsion coil spring (LB) ❺ into the axle ⓫, then hook it to the mechanism chassis notch ⓬ and to the tab ⓭.
6) Mount the TS brake assembly ❹ and close the claw ❸.
7) Apply half a drop of oil to the axle ⓰ (See Fig. D).
8) Mount the idler pulley ❷ onto the axle ⓰, then secure it with the stopper washer ❶.
9) Mount the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly as described in section 3-15.
10) Mount the switch lever assembly as described in section 3-14.
11) Mount the DC motor (capstan motor) as described in section 3-3.

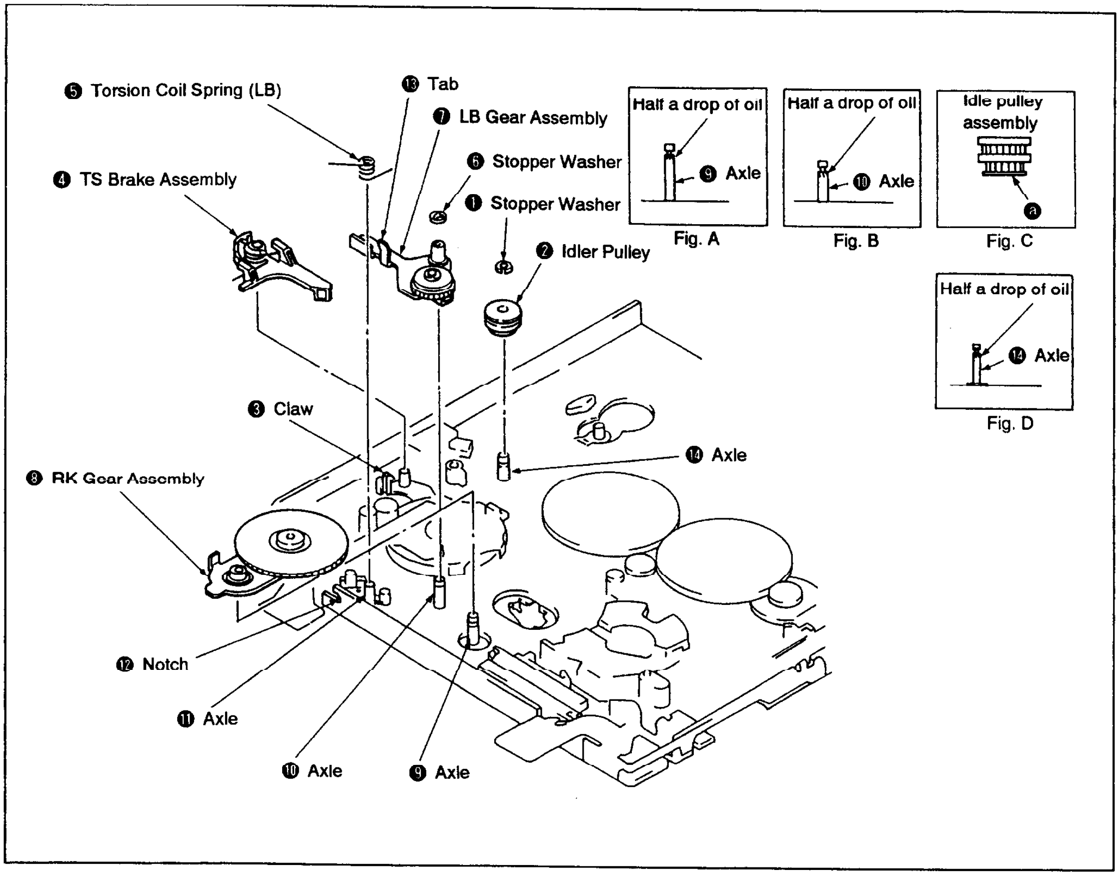

❺ Torsion Coil Spring (LB)
⓭ Tab
❼ LB Gear Assembly
❻ Stopper Washer
❶ Stopper Washer
❹ TS Brake Assembly
❷ Idler Pulley
❸ Claw
⓮ Axle
❽ RK Gear Assembly
⓬ Notch
⓫ Axle
❿ Axle
❾ Axle
Half a drop of oil
❾ Axle
Fig. A
Half a drop of oil
❿ Axle
Fig. B
Idle pulley assembly
ⓐ
Fig. C
Half a drop of oil
⓮ Axle
Fig. D

Fig. 3-17.

3-17. UL GEAR, UL BRAKE, UL ARM, LB PLATE SPRING

1. Removal (See Fig. 3-18.)

1) Remove the switch lever assembly as described in section 3-14.
2) Remove the stopper washer ❶, then remove the UL gear ❷.
3) Remove the UL arm ❸, the 1.6 mm-diameter poly washer ❹ and the LB plate spring ❺.
4) Remove the UL brake ❻.

2. Installation (See Fig. 3-18.)

1) Mount the UL brake ❻.
2) Apply half a drop of oil to the axle ❼ (See Fig. A).
3) Mount the LB plate spring ❺ to the axle ❼ as shown in Fig. B, then install the 1.6mm-diameter poly washer ❹.
4) Mount the UL arm ❸ to the axle ❼ so that the protrusion ❽ comes into the groove ❾ of the UL brake ❻.
5) Mount the UL gear ❷ to the axle ❼ and engage it with the gear of the drive gear (left) assembly ❿.
6) Install the stopper washer ❶.
7) Mount the switch lever assembly as described in section 3-14.

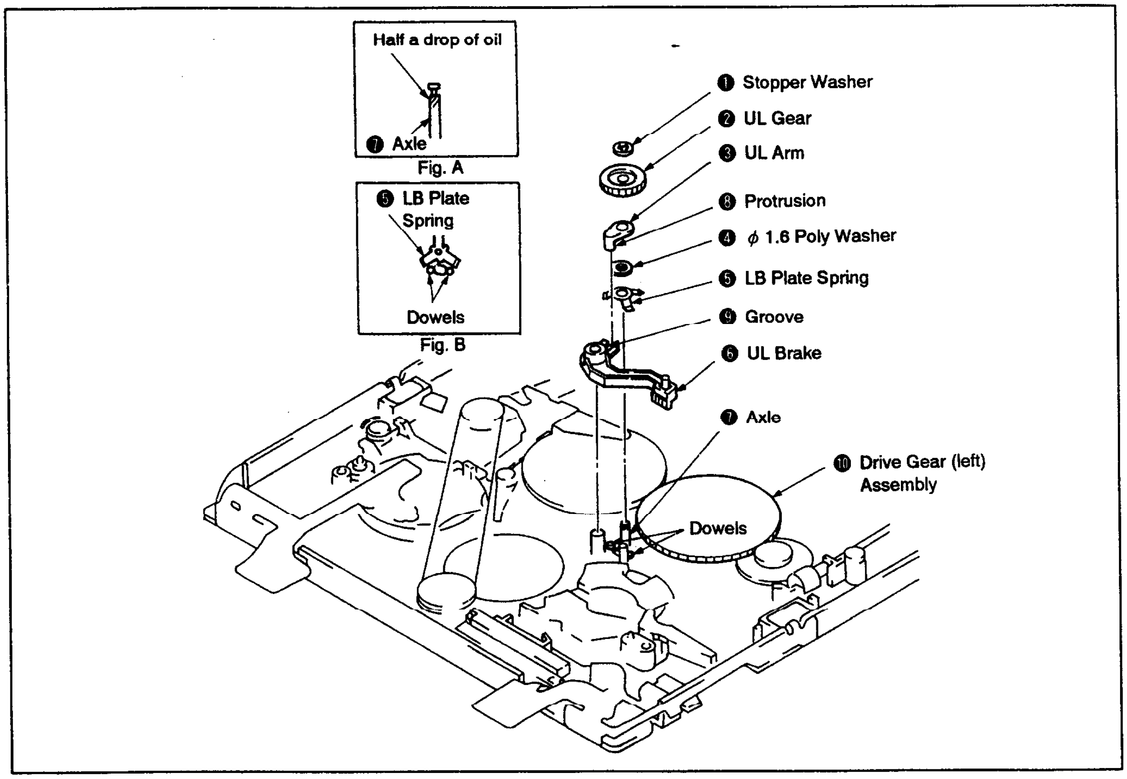

Half a drop of oil
❼ Axle
Fig. A
❺ LB Plate Spring
Dowels
Fig. B
❶ Stopper Washer
❷ UL Gear
❸ UL Arm
❽ Protrusion
❹ ϕ 1.6 Poly Washer
❺ LB Plate Spring
❾ Groove
❻ UL Brake
❼ Axle
❿ Drive Gear (left) Assembly
Dowels

Fig. 3-18.

3-18. COASTER (RIGHT) ASSEMBLY, DRIVE GEAR (RIGHT) ASSEMBLY

1. Removal (See Fig. 3-19.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the drum unit as described in section 3-13.
3) Remove the switch lever assembly as described in section 3-14.
4) Remove the timing belt (L) , the RC gear assembly and the loading lever assembly as described in section 3-15.
5) Set the STOP mode.
6) Remove the screw ❶ , then remove the coaster plate spring ❷ and the coaster (right) assembly ❸ .
7) Remove the two screws ❹ , then remove the reinforcing plate TT ❺ .
8) Remove the stopper washer 1.5 ❻ , then remove the drive gear (right) assembly ❼ .

2. Installation (See Fig. 3-19.)

1) Grease the points of the mechanism chassis shown in Fig A.
2) Apply half a drop of oil to the axle ❽ (See Fig. F).
3) Grease pin ❾ , axle ❿ and dowel ⓮ of the coaster (right) assembly ❸ (See Fig. D).
4) Mount by aligning the pin ❾ and the axle ❿ with the slot ⓫ of the mechanism chassis.
5) Move the brake release arm ⓬ in the direction of the arrow Ⓐ to put it out of the way.
6) Mount the drive gear (right) assembly ❼ to the axle ❽ , and engage it with the drive gear (left) assembly ⓭ as shown in Fig. B.
7) Align the ⓐ part with the ⓑ part, and the hole ⓮ with the pin ❾ of the coaster (right) assembly ❸ .
8) Install the stopper washer 1.5 ❻ .
9) Mount by aligning the coaster plate spring ❷ with the axle ❿ of the coaster (right) assembly ❸ and pin ❾ , then secure with the screw ❶ .
10) Mount the reinforcing plate TT ❺ aligning it with the dowel ⓯, then tighten the two screws ❹ in the indicated order.
11) Grease the points indicated in Figs. C and E.
12) Mount the timing belt (L) , the RC gear assembly and the loading lever assembly as described in section 3-15.
13) Mount the switch lever assembly as described in section 3-14.
14) Mount the drum unit as described in section 3-13.
15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:
- Screw ❶ should be tightened with a tightening torque of approx. 500g•cm. If tightened too much, the coaster (right) assembly ❸ and the coaster plate spring ❷ will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

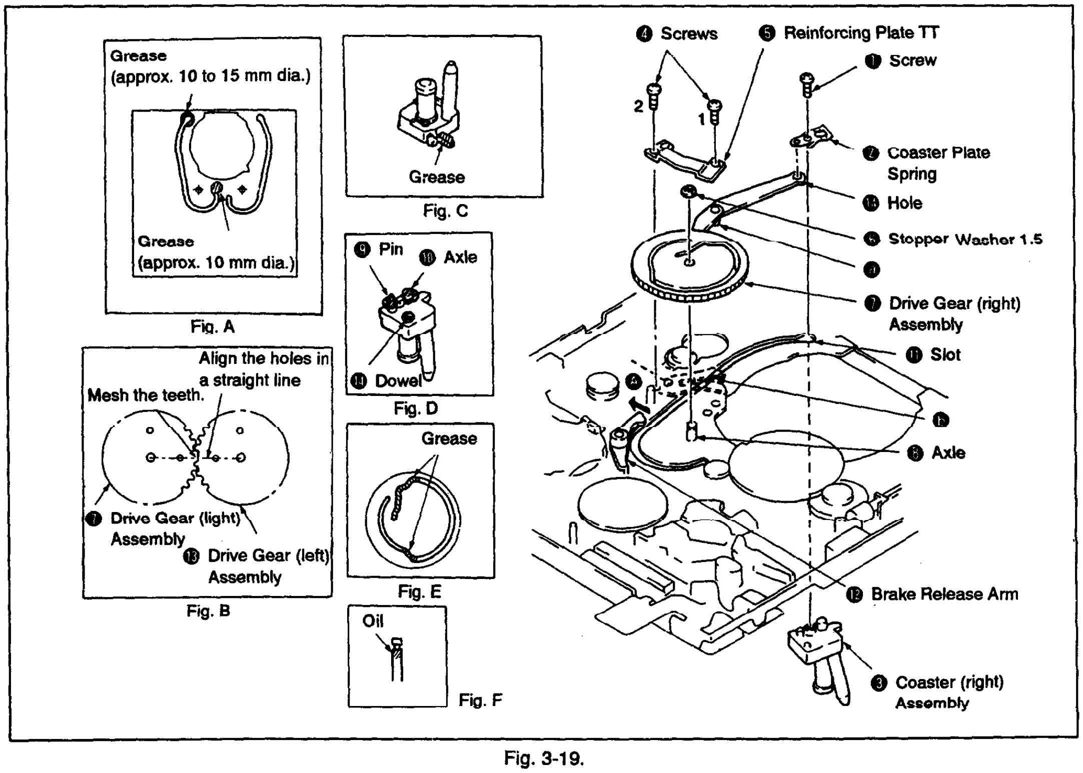

Grease
(approx. 10 to 15 mm dia.)
Grease
(approx. 10 mm dia.)
Fig. A
Align the holes in a straight line
Mesh the teeth.
❼ Drive Gear (light) Assembly
⓭ Drive Gear (left) Assembly
Fig. B
Grease
Fig. C
❾ Pin
❿ Axle
⓮ Dowel
Fig. D
Grease
Fig. E
Oil
Fig. F
❹ Screws
❺ Reinforcing Plate TT
❶ Screw
2
1
❷ Coaster Plate Spring
⓮ Hole
❻ Stopper Washer 1.5
ⓐ
❼ Drive Gear (right) Assembly
⓫ Slot
Ⓐ
ⓑ
❽ Axle
⓬ Brake Release Arm
❸ Coaster (right) Assembly

Fig. 3-19.

3-19. COASTER (LEFT) ASSEMBLY, DRIVE GEAR (LEFT) ASSEMBLY

1. Removal (See Fig. 3-20.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the drum assembly as described in section 3-13.
3) Remove the switch lever assembly and the pinch roller sub-arm assembly as described in section 3-14.
4) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
5) Remove the coaster (right) assembly and the drive gear (right)assembly as described in section 3-18.
6) Remove the screw ❶, then remove the coaster plate spring ❷ and the coaster (left) assembly ❸.
7) Remove the two screws ❹, then remove the reinforcing plate SS assembly ❺.
8) Remove the stopper washer 1.5 ❻, then remove the drive gear (left) assembly ❼.

2. Installation (See Fig. 3-20.)

1) Grease the points of the mechanism chassis shown in Fig A.
2) Apply half a drop of oil to the axle ❽ (See Fig. E).
3) Grease pin ❾, axle ❿ and dowel ⓯ of the coaster (left) assembly ❸ (See Fig. B).
4) Mount by aligning the pin ❾ and the axle ❿ with the slot ⓫ of the mechanism chassis.
5) Fit the drive gear (left) assembly ❼ to the axle ❽, and mount so that the gear engages with the wheel gear ⓬ and the UL gear ⓭.
6) Align the ⓐ part with the slot ⓫, and the hole ⓮ with the pin ❾ of the coaster (left) assembly ❸.
7) Install the stopper washer 1.5 ❻.
8) Mount by aligning the coaster plate spring ❷ with the axle ❿ and pin ❾ of the coaster (left) assembly ❸, then secure with the screw ❶.
9) Mount the reinforcing plate SS assembly ❺ aligning it with the dowel ⓯, then tighten the two screws ❹ in the indicated order.
10) Grease points indicated in Figs. C and D.
11) Mount the coaster (right) assembly and the drive gear (right)assembly as described in section 3-18.
12) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
13) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
14) Mount the drum assembly as described in section 3-13.
15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:
- Screw ❶ should be tightened with a tightening torque of approx. 500g•cm. If tightened too much, the coaster (right) assembly ❸ and the coaster plate spring ❷ will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

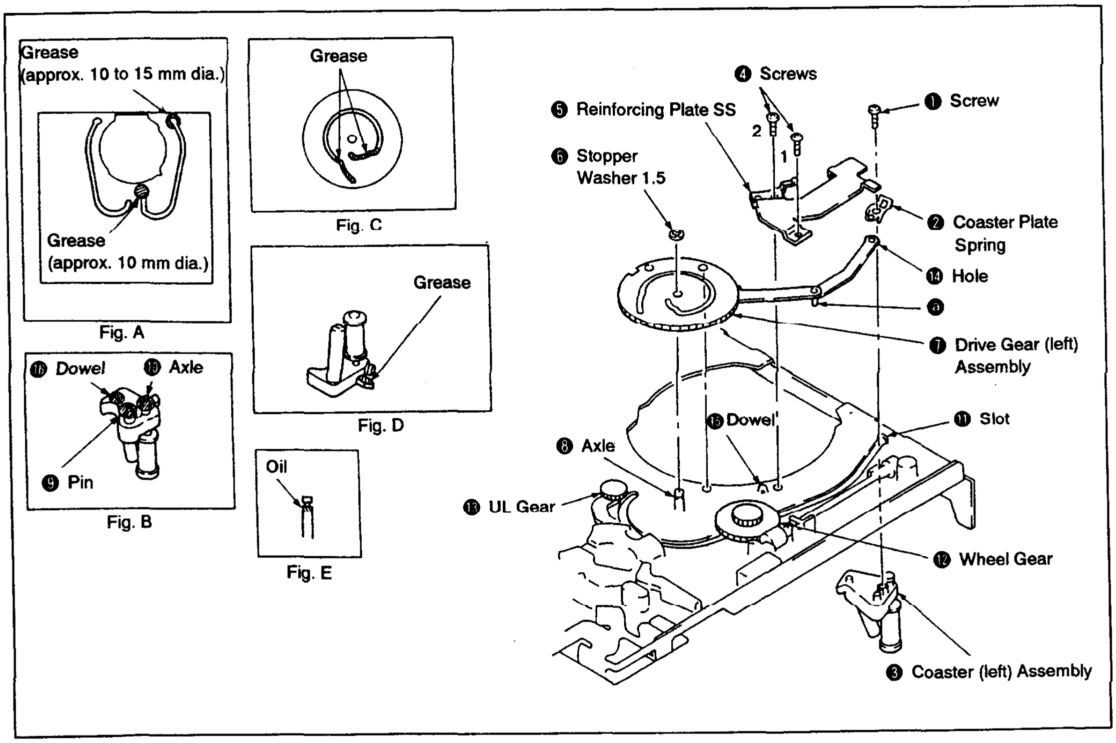

Grease
(approx. 10 to 15 mm dia.)
Grease
(approx. 10 mm dia.)
Fig. A
⓯ Dowel
❿ Axle
❾ Pin
Fig. B
Grease
Fig. C
Grease
Fig. D
Oil
Fig. E
❹ Screws
❺ Reinforcing Plate SS
2
1
❻ Stopper Washer 1.5
❶ Screw
❷ Coaster Plate Spring
⓮ Hole
ⓐ
❼ Drive Gear (left) Assembly
⓫ Slot
⓯ Dowel
❽ Axle
⓭ UL Gear
⓬ Wheel Gear
❸ Coaster (left) Assembly

Fig. 3-20.

3-20. LOADING MOTOR, BRAKE RELEASE ARM, WHEEL GEAR, WORM ASSEMBLY

1. Removal (See Fig. 3-21.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
3) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
4) Remove the drive gear (right) assembly as described in section 3-18.
5) Remove the drive gear (left) assembly as described in section 3-19.
6) Remove the two screws ❶, then remove the loading motor assembly ❷.
7) Remove the brake release arm ❸.
8) Remove the stopper washer ❹, then remove the wheel gear ❺.
9) Remove the worm assembly ❻ from the six claws ❼.

2. Installation (See Fig. 3-21.)

1) Mount the worm assembly ❻, matching it to the six claws ❼.
2) Grease the shaded parts of the worm assembly ❻ (five places) (see Fig A).
3) Apply half a drop of oil to the axle ❽ (See Fig. B).
4) Fit the wheel gear ❺ to the axle ❽ and engage it with the gear of the worm assembly ❻.
5) Mount the brake release arm ❸.
6) Grease the whole perimeter of the gear of the loading motor assembly ❷.
7) Align the loading motor assembly ❷ with the mechanism chassis and secure it with the two screws ❷.
8) Mount the drive gear (left) assembly as described in section 3-19.
9) Mount the drive gear (right) assembly as described in section 3-18.
10) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
11) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
12) Mount the DC motor (capstan motor) as described in section 3-3.

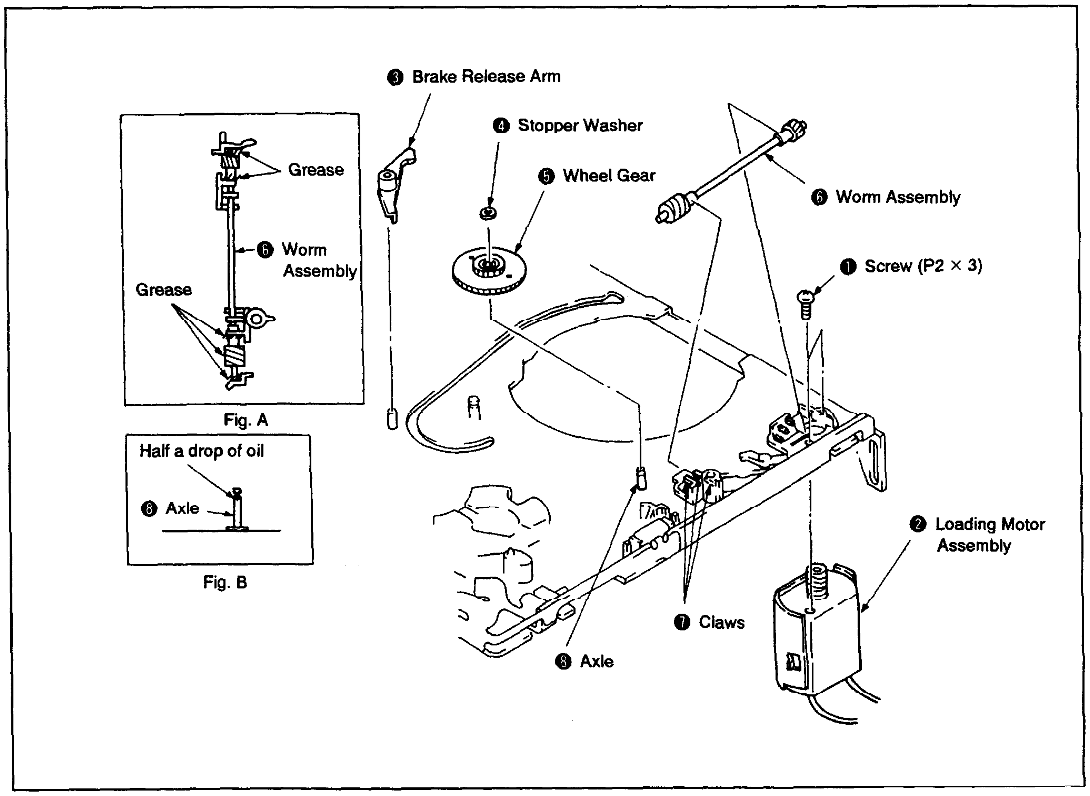

Grease
❻ Worm Assembly
Grease
Fig. A
Half a drop of oil
❽ Axle
Fig. B
❸ Brake Release Arm
❹ Stopper Washer
❺ Wheel Gear
❻ Worm Assembly
❶ Screw (P2 × 3)
❷ Loading Motor Assembly
❼ Claws
❽ Axle

Fig. 3-21.

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removal

- If possible, make a recording before removal.

1) Detach the six solderings ❾, then use a pair of tweezers or the like to confirm that the terminals passing through the board holes from below can move freely.
2) Remove the two screws ❶ (See Fig. 3-22).
3) Mount the jig ❹ (Ref. No. J-7) with the two supplied screws ❷, then screw the attached hexagon socket screws ❸ to the jig ❹. The rotary upper drum ❺ will move upward and come off (See Fig. 3-23).

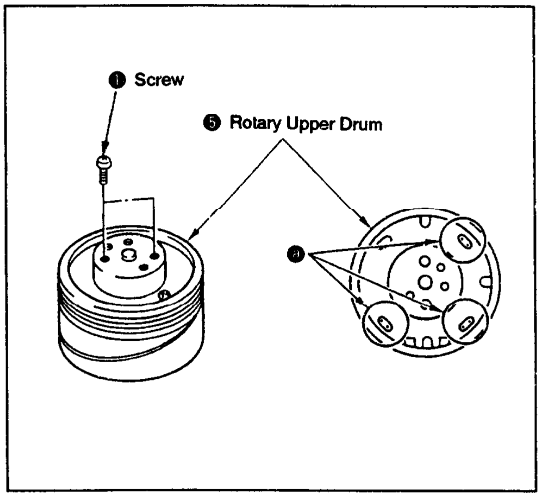


Fig. 3-22.

2. Installation

1) Wipe clean the flange surface and the rotary upper drum ❺ surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig ❼ (Ref. No. J-7) into the drum positioning hole, then set the rotary upper drum ❺ by passing the jig through its positioning hole ❻.
   Note: Confirm that the terminals ❽ protrude slightly from the rotary upper drum board holes (See Fig. 3-24).
3) Remove the jig ❼ and push down the rotary upper drum ❺ gently by hand. If it does not go all the way down, secure it temporarily by tightening the two hexagon socket screws ❶ alternately.
4) Insert the jig ❼ into the positioning hole ❻ again and confirm that it goes in smoothly. If it does not, loosen the two screws ❶, repeat step 3 of the Removal paragraph and restart the setting procedure.
5) Tighten the screws ❶.
6) Solder the terminals ❽ (❾ in Fig. 3-22).
   Note: Take care that no solder flows below the board.

Note: After installing, be sure to perform tape path adjustment as described in section 4.

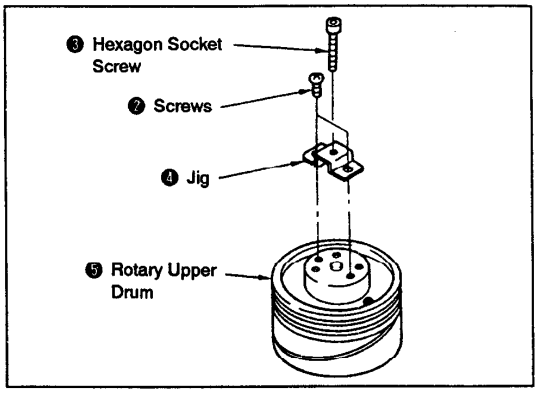


Fig. 3-23.

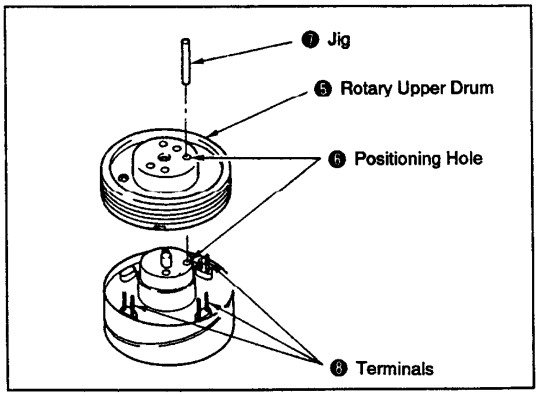


Fig. 3-24.

3-22. FWD BACK TENSION (See Fig. 3-25.)

1) Set the torque cassette (Ref. No. J-6).
2) Set the FWD mode and confirm that S reel table torque value is within 9 to 13 g•cm.
3) If the torque value does not meet the specification, adjust the adjust arm ❶.

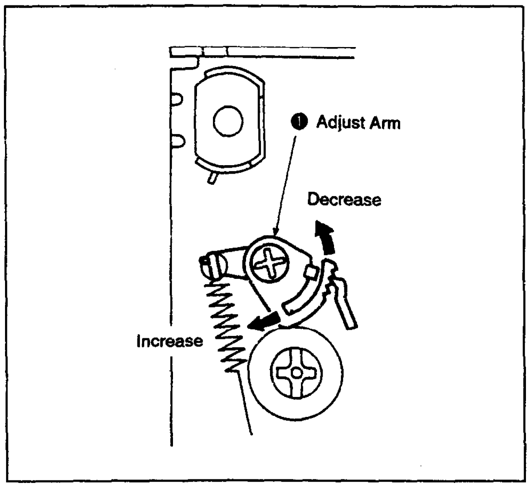


Fig. 3-25.

3-23. REEL TORQUE CHECK

1) Set the torque cassette.
2) Set the FWD mode and confirm that T reel table torque value is within 7 to 15 g•cm.
3) Set the REV mode and confirm that S reel table torque value is within 29 ± 6 g•cm.
4) Set the REV mode and confirm that T reel table torque value is within 13 to 25 g•cm.
5) If a torque value does not meet the specifications above, replace the corresponding reel table.

4. TAPE PATH ADJUSTMENT

[The Track Shift Mode]

In the 8 mm video system, instantaneous tape speed control is performed using four kinds of pilot signals, and high-precision tracking is achieved through the ATF (Automatic Track Finding) system. This makes a tracking control knob unnecessary and allows for precise tracing.

On the other hand, however, tape path adjustment presents some difficulties when the ATF system is used. Namely, since the ATF system will automatically compensate to some degree for head tracing errors, thorough adjustment is not possible.

This can be solved by setting the track shift mode for tracking fine adjustment. ATF will be compulsorily activated, shifting the tracking amount by a fixed amount (approx. 1/4) and thus making tracking fine adjustment easy. Furthermore, no track shift jigs are required.

4-1. TRACK SHIFT MODE SETTING

[Setting Procedure]

- Connect the TEST A and TEST B terminals to the COM terminal.

  Example:

  NTSC ········ GV-8

  PAL ·········· GV-8E

  Connect Pins ① and pin ③ of CN017 on the { SV-34 board (GV-8) / SV-35 board (GV-8E) } to pin ② of it. (See Fig. 4-1)

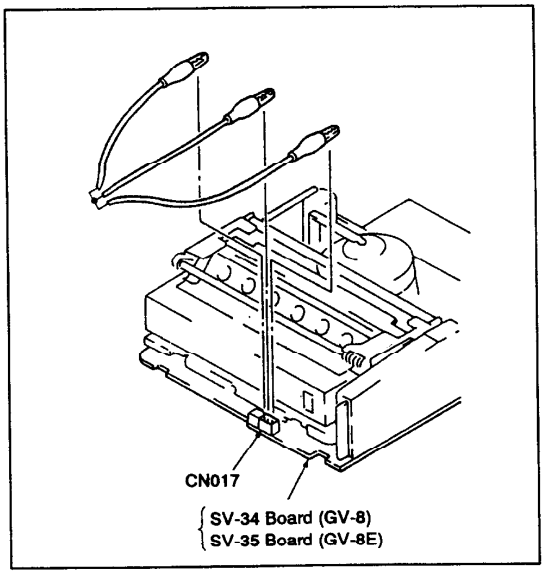
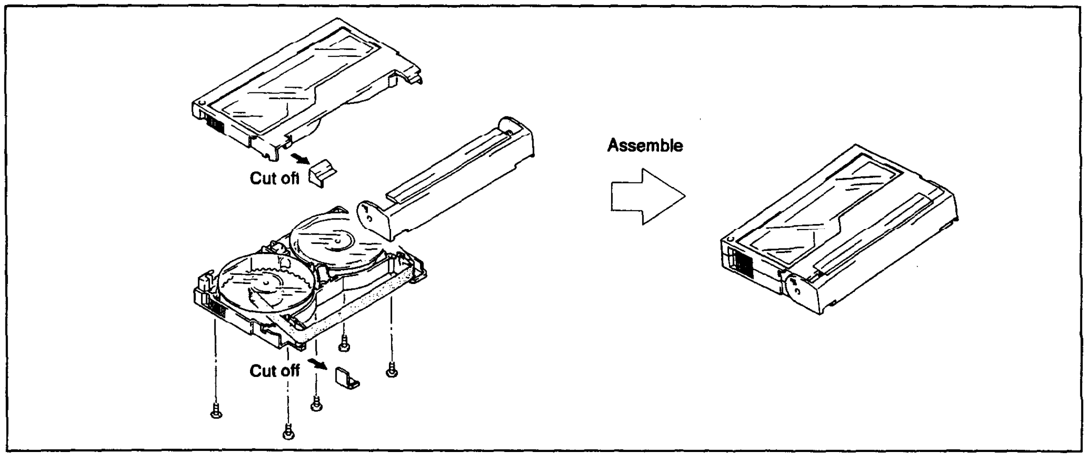


Fig. 4-1.

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig. 4-2).
Therefore, when performing section 4-6. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-5), modified as follows, and perform adjustment in playback mode.


Cut off
Cut off
Assemble

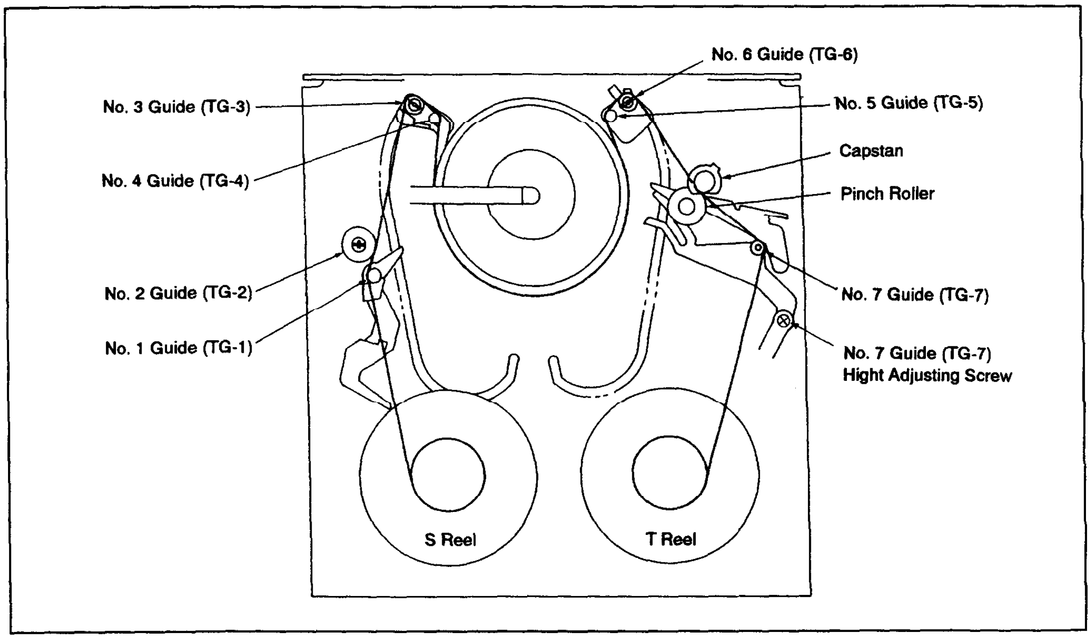

No. 6 Guide (TG-6)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
Capstan
No. 4 Guide (TG-4)
Pinch Roller
No. 2 Guide (TG-2)
No. 7 Guide (TG-7)
No. 1 Guide (TG-1)
No. 7 Guide (TG-7)
Hight Adjusting Screw
S Reel
T Reel

Fig. 4-2.

4-2. PREPARATIONS FOR ADJUSTMENT

1) Clean tape path surfaces (tape guides, drum, capstan shaft, pinch roller) (See Fig. 4-2).
2) Connection of oscilloscope and output method of waveform.
   CH 1: RF signal output of the drum head (V RF OUT)
   Method for signal output:
   Short-circuit the external trigger output (RF SW. P) and GND.

   Example:
   NTSC ····· GV-8
   PAL ······· GV-8E
   CH 1: Pin ③ (V RF OUT) of CN018 on the
   { SV-34 board (GV-8)
   { SV-35 board (GV-8E)
   Method for signal output:
   Short-circuit pin ① (GND) and pin ② (RF SW.P) of CN018 on the
   { SV-34 board (GV-8)
   { SV-35 board (GV-8E)
3) Play back the alignment tape for tracking adjustment (Ref. No. J-5).
4) Confirm that both the entrance and exit side RF waveforms of the oscilloscope are flat (See Fig. 4-4). If they are not, adjust as follows.

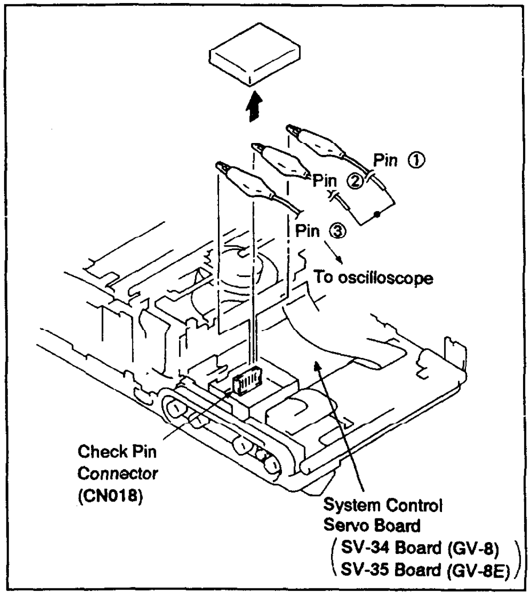

Pin ①
Pin ②
Pin ③
To oscilloscope
Check Pin Connector (CN018)
System Control Servo Board
(SV-34 Board (GV-8)
SV-35 Board (GV-8E))

Fig. 4-3.

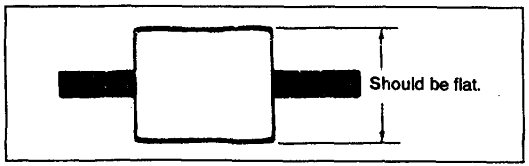

Should be flat.

Fig. 4-4.

4-3. TRACKING ADJUSTMENT (See Fig. 4-5.)

1) Play back the alignment tape for tracking adjustment.
2) Pass a hexagonal wrench, screwdriver (Ref. No. J-11) or the like through the hole ❶, loosen the lockscrew ❷ a little, then make the entrance side waveform flat by turning the No. 3 guide (TG-3) ❸.
3) Pass a hexagonal wrench, screwdriver or the like through the hole ❹, loosen the lockscrew ❺ a little, then make the exit side waveform flat by turning the No. 6 guide (TG-6) ❻.

Note: Take care not to loosen lockscrews too much, since guides come loose easily.

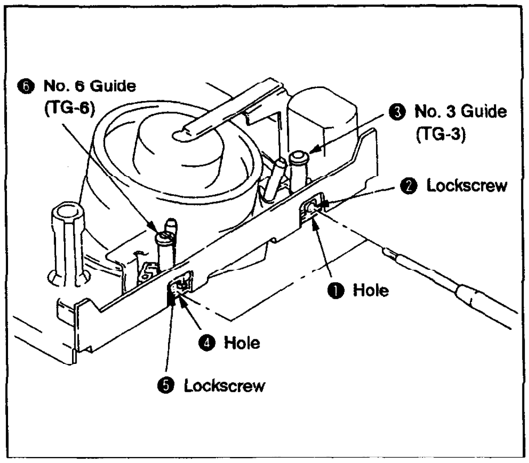

❻ No. 6 Guide (TG-6)
❸ No. 3 Guide (TG-3)
❷ Lockscrew
❶ Hole
❹ Hole
❺ Lockscrew

Fig. 4-5.

4-4. TRACKING FINE ADJUSTMENT (See Figs. 4-5. and 4-6.)

1) Play back the alignment tape for tracking adjustment and set the track shift mode.
2) Confirm whether the waveform is flat. If it is not, turn the No. 3 (TG-3) and No. 6 (TG-6) guides so that it becomes flat.
3) Fix the No. 3 guide ❸ by tightening its lockscrew ❷. Then confirm that the entrance side waveform has not changed.
4) Fix the No. 6 guide ❻ by tightening its lockscrew ❺. Then confirm that the exit side waveform has not changed.

Note: The set screws ❷ and ❺ should be tightened with a tightening torgue of approx. 200g•cm ± 10%.
If tightened too much, there is danger of damaging the thread.

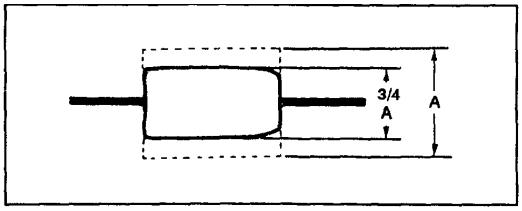


Fig. 4-6.

4-5. No. 2 GUIDE (TG-2) ADJUSTMENT

When the No. 2 guide has been turned or replaced, perform height presetting before this adjustment.

4-5-1. No. 2 Guide (TG-2) Height Presetting (See Fig. 4-7.)

1) Adjust the height from the mechanism chassis upper surface to the TG-2 upper flange ❶ upper surface to 18.6 mm by rotating the TG-2 upper flange ❶.

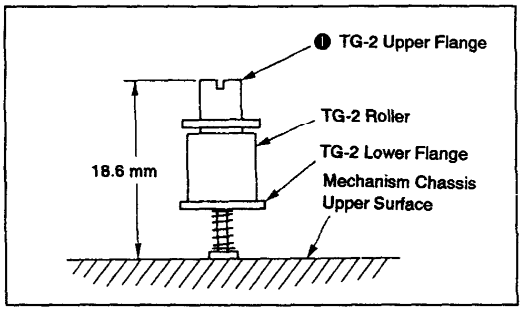


Fig. 4-7.

[Reference]
This U mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7). To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Counterclockwise
	Lower	Clockwise

4-5-2. No. 2 Guide (TG-2) Adjustment (See Figs. 4-8. and 4-9.)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ❷ of the No. 2 guide (TG-2) ❶ (See Fig. 4-8). If it is, turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and tracking fine adjustment as described in sections 4-3. and 4-4.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (See Fig. 4-9), turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ 90° counter-clockwise and repeat step 5.
   Repeat steps 5 and 6 until a normal waveform is obtained. Then, confirm that the tracking waveform has not changed. If it has, perform fine adjustment of entrance side tracking and repeat step 5.

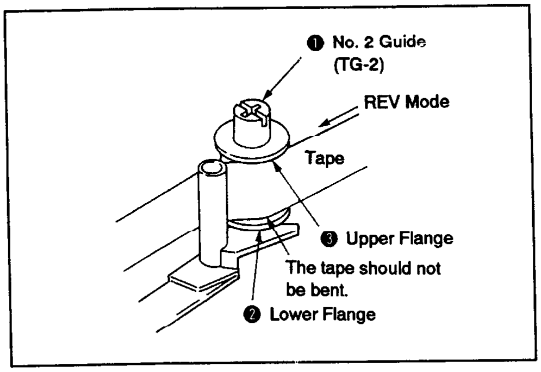

❶ No. 2 Guide (TG-2)
REV Mode
Tape
❸ Upper Flange
The tape should not be bent.
❷ Lower Flange

Fig. 4-8.

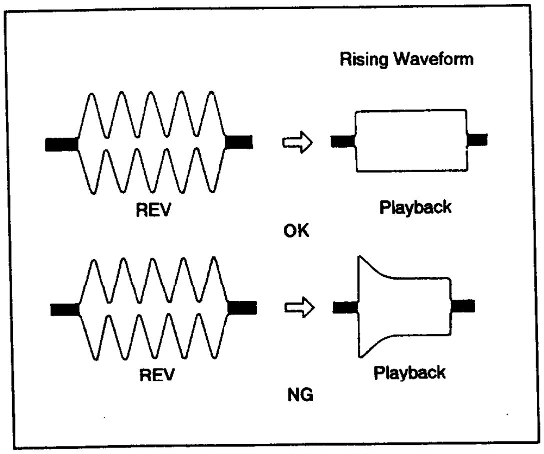

Rising Waveform
REV
Playback
OK
REV
Playback
NG

Fig. 4-9.

4-6. No. 7 GUIDE (TG-7) ADJUSTMENT (See Fig. 4-10.)

1) Play back the alignment tape for tracking adjustment and set the REV mode.
2) Confirm that the tape is not bent between the No. 6 guide (TG-6) ❶ and the capstan ❷ . If it is, turn the hight adjusting screw ❹ of the No. 7 guide (TG-7) ❸ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ❷ and the hight adjusting screw ❹ of the No. 7 guide (specification:0.5 mm or less) . If the tape is bent beyond the specification, turn the No. 7 guide (TG-7) ❸ until bending is within the specification (0.5 mm).
   If in the REV mode tape bending between the No. 6 guide (TG-6) ❶ and the capstan ❷ is 0.3 mm or less, adjustment can be considered completed.

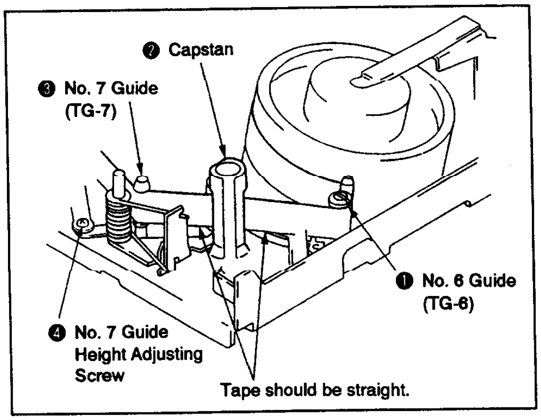

❷ Capstan
❸ No. 7 Guide (TG-7)
❶ No. 6 Guide (TG-6)
❹ No. 7 Guide Height Adjusting Screw
Tape should be straight.

Fig. 4-10.

4-7. CUE AND REV WAVEFORM CHECK (See Fig. 4-11.)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (See Fig. 4-11). In case pitch is not constant, perform section 4-4. Tracking Fine Adjustment and section 4-6. No. 7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (See Fig. 4-11). Otherwise, perform section 4-4. Tracking Fine Adjustment.

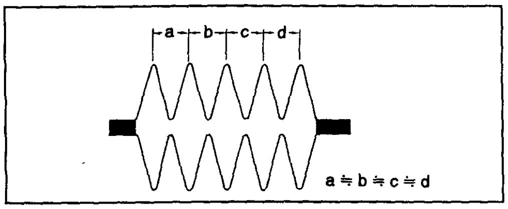


Fig. 4-11.

4-8. CHECK AFTER ADJUSTMENT

4-8-1. Tracking Check

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (See Fig. 4-12).
2) Then, confirm that the minimum amplitude value (EMIN) is 65% of the maximum value (EMAX) or larger (See Fig. 4-13).
3) Confirm that no large fluctuations occur on the waveform (See Fig. 4-14).

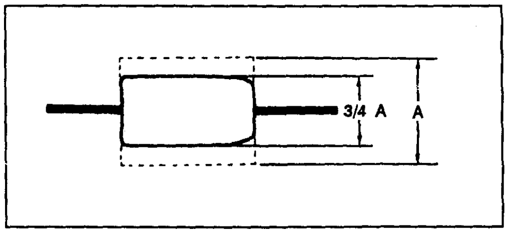
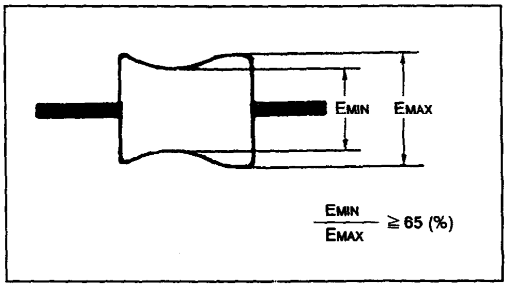
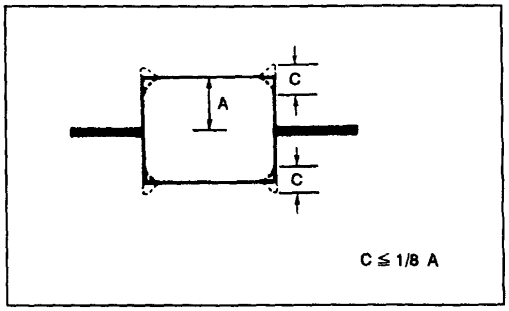


Fig. 4-12.



$$\frac{E_{MIN}}{E_{MAX}} \geqq 65\ (\%)$$

Fig. 4-13.



$C \leqq 1/8\ A$

Fig. 4-14.

4-8-2. Rising Check (See Fig. 4-15.)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller (See Fig. 4-15).
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

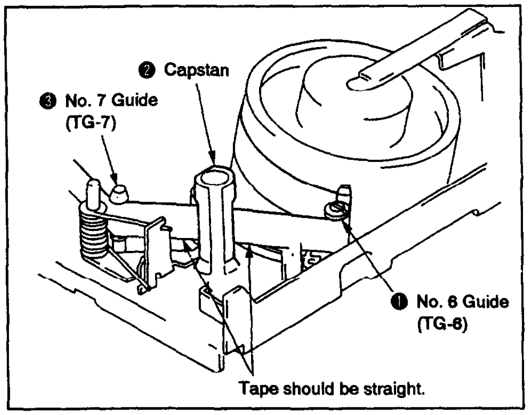

❷ Capstan
❸ No. 7 Guide (TG-7)
❶ No. 6 Guide (TG-6)
Tape should be straight.

Fig. 4-15.

4-8-3. Tape Path Check (See Fig. 4-16.)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3 mm, at the lower flange of the No. 2 guide, the upper flange of the No. 3 guide, the upper flange of the No. 6 guide and the No. 7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3 mm at the flanges of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

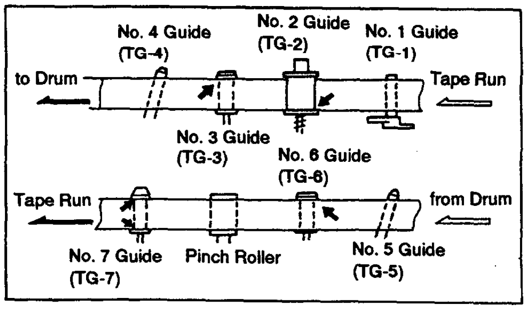

No. 4 Guide (TG-4)
No. 2 Guide (TG-2)
No. 1 Guide (TG-1)
to Drum
Tape Run
No. 3 Guide (TG-3)
No. 6 Guide (TG-6)
Tape Run
from Drum
No. 7 Guide (TG-7)
Pinch Roller
No. 5 Guide (TG-5)

Fig. 4-16.